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OR,

Universal Dictionary

OF

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OF

Arts, Sciences, and Literature.

BY

ABRAHAM REES, D.D. F.R.S. F.L.S. *S. Amer. Soc.*

WITH THE ASSISTANCE OF

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IN THIRTY-NINE VOLUMES.

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OF

ARTS and SCIENCES.

LIGHT-HOUSE.

LIGHT-HOUSE, in the *Marine*, is a building or watch-tower erected upon the ſea-ſhore, to ſerve as a landmark to mariners in the night, to avoid any rocks or other dangers. The light-houſe is generally a high tower, having at the top an apartment called the lantern, with windows on all ſides, to exhibit the light made within it by the flame of an open fire, or by lamps or candles. It is frequently of ſervice to navigation, to erect light-houſes upon inſulated rocks riſing from the ſea, to warn ſhips of their approach to ſuch rocks. Of this kind are the Eddyſtone rocks off Plymouth, and the Bell rock at the mouth of the Forth in Scotland. In theſe ſituations, the heavy ſwell of the ſea, when agitated by a ſtorm, ſtrikes with ſuch force againſt the building, as to require every precaution to ſecure them from being overthrown by the continued action of ſo powerful an enemy. The Eddyſtone rocks being the moſt celebrated, as well from their peculiarly expoſed ſituation, as from the great ingenuity diſplayed in the conſtruction of the light-houſes erected at different periods upon them, renders them deſerving of particular deſcription. The hiſtory of the different erections has been already given under the head of EDDYSTONE. We here intend deſcribing the conſtruction of each, which will be a ſummary of all the different kinds of light-houſes of wood or ſtone.

Mr. Winſtanley's light-houſe was begun upon the Eddyſtone rock in 1696, and was more than four years in the erection, from the many interruptions of the wind, which from ſome quarters cauſes the ſea to break over theſe rocks with ſuch violence, as to prevent the poſſibility of landing upon them, though the ſea around is very quiet. This is occaſioned by the rocks being open to the ſwell from the Great Atlantic ocean, or from the Bay of Biſcay, in all the ſouth-weſtern points of the compaſs; and is increaſed by the form and poſition of the rocks, which have a regular ſlope to the ſouth-weſt from the deep ſea to the rock upon which the houſe is erected, and which, therefore, receives the uncontrouled fury of theſe ſeas, meeting no other object to break upon, and the effect of ſo great an extent of water, cauſed by the hard S.W. winds, continues for many days, though ſucceeded by a calm, and breaks frightfully upon Eddyſtone. When there is no wind, and the ſurface of the ſea appears ſmooth, Mr. Winſtanley's light-houſe appears, from an engraved plate of it, publiſhed by himſelf, to have been a ſtone tower with 12 ſides, riſing 44 feet above the higheſt point of the rock, which is inclined ſo as to be 10 feet lower on the oppoſite ſide of the houſe. The tower was 24 feet in diameter. At the top were a baluſtrade and platform: upon this eight pillars were erected, and ſupported a dome of the ſame diameter as the tower. From the top of this aroſe a ſmaller octagonal tower, 15 feet in diameter and ſeven in height; and upon this was the lantern 10 feet in diameter, and 12 high, containing the lights. It had a gallery or balcony ſurrounding it, to give acceſs to the outſide of the windows. The whole was ſurmounted by a fanciful iron work with a vane. The entry was by a door at the bottom, which was ſolid ſtone, except the aperture for the ſtaircaſe, 12 feet in height. Above this were three floors, the loweſt being the ſtore-room, the next the ſtate-room, and the third the kitchen. Theſe occupied the height up to the level of the platform, or open gallery above-mentioned. The dome above this contained the lodging-room, and the octagon above it the attending or look-out room, immediately beneath the lantern. This edifice was, as before-mentioned, more than four years in erecting. The firſt ſummer (for it is only in this ſeaſon the rock is acceſſible) was ſpent in making 12 holes in the rock, and faſtening 12 great irons to hold the future work. In the ſecond year, a ſolid pillar 14 feet diameter, and 12 feet high, was built as a core or centre for the building. The third year the pillar was increaſed to 16 feet diameter, and all the work was raiſed, which to the vane was at that time 80 feet. The workmen lodged in the houſe ſoon after Midſummer, but were by bad weather impriſoned 11 days before a boat could relieve them. A light was exhibited on the 14th of Nov. 1698. But finding that the ſea frequently broke over the lantern, in the fourth year the whole building was encompaſſed with a new work of four feet in thickneſs, made ſolid for near 20 feet high, and the lantern was raiſed 40 feet higher than at firſt, making it 90 feet to the top of the cupola of the lantern, above which the vane roſe 22 feet. "Yet after all," Mr. Winſtanley ſays, "the ſea in ſtorms flies in appearance 100 feet above the vane, and at times doth cover half the ſide of the houſe and the lantern, as if it were under water." The joints of the additional ſtone work of the fourth year, appear to have been covered with an iron or copper hoop encompaſſing the building, to prevent the ſea waſhing out the mortar. The building withſtood the waſh of the ſea only till the year 1703, when the inventor, being at Plymouth to ſuperintend ſome repairs of the building, went off to it on ſome of his friends intimating the danger of the building, from a ſtorm which ſeemed coming on. He expreſſed a wiſh that he might be preſent in the moſt violent ſtorm which ever blew, to obſerve its effect on the ſtructure. In this he was too amply gratified, for on the 26th of November a violent ſtorm aroſe, and the next morning no veſtige of the light-houſe remained, except ſome of the irons which were faſtened in the rock, and a piece of iron chain, which was jambed faſt into a chink of the rock, and nothing was ever afterwards found. Thus periſhed the firſt light-houſe with its ingenious, but unfortunate, builder. A Weſt Indian ſhip was loſt on the rocks ſoon after the light-houſe was overthrown. This circumſtance, and the great utility of the light while exhibited, ſtimulated the Board of Trinity houſe, who had the management of the building, to erect another, and an act of parliament, of the 4th of queen Anne, was paſſed in 1706, to enable the Board of Trinity houſe to raiſe duties on ſhips to rebuild it, of which they granted a leaſe of 99 years to Capt. Lovel, as he engaged to build and maintain the houſe. In July 1706, the work was begun under the direction of Mr. John Rudyerd, who was at that time a ſilk mercer on Ludgate hill, London, but who appears to have poſſeſſed much ingenuity and mental reſource. He, like Mr. Winſtanley, publiſhed a print drawn by B. Leus, and engraved by J. Sturt, which informs us, that it was a conical fruſtum of wood, formed of 71 upright beams, united together by being bolted to circular kirbs of wood withinſide, upon which kirbs the floors were framed. It, in ſome degree, reſembled an immenſe conical caſk, but without hoops: the diameter at the baſe was 23 feet, at the top 15 feet, and its altitude, from the higheſt point of the rock to the top of the upright, was 62 feet. At the top of the building was a balcony, ſurrounded by a railing, and in the centre of the area thus formed the lantern was ſituated. It had windows on all ſides, and was of an octagonal figure, 10 feet in diameter, and 13 high, ſurmounted by a dome with a ſimple ball at top, inſtead of the fanciful iron work which ornamented the firſt edifice. Mr. Rudyerd, from principles totally different from thoſe of his predeceſſor, made his building quite plain, without the leaſt projection or ornament on which the water could act when daſhing againſt it; and he omitted no precaution of uniting all the parts together, and faſtening the whole to the rock. As the ſurface of the rock was naturally inclined, and the whole building would have had a tendency to ſlide down it, if merely placed upon it, as Mr. Winſtanley's was, Mr. Rudyerd wiſhed to reduce its ſurface into level ſteps, upon which each timber would have a horizontal bearing; but finding this to be the moſt difficult of the whole undertaking, it was imperfectly executed, only five ſteps being cut, and thoſe did not take out all the inclined ſurface; however, it was ſufficient for the purpoſe.

The building was filled up quite ſolid for 19 feet from the loweſt point of the rock, and, excepting the well for the ſtair-caſe, was ſolid to the height of 37 feet. The ſolid was formed of three beds of moor ſtone, with ſtrong floorings of timbers between each bed, to unite them with the external uprights. The lower bed contained five courſes of ſtone, and was five feet thick; the ſecond was the ſame, and the third was four feet thick, containing four courſes. The whole erection, in addition to the weight of this ſtone, which was about 280 tons, was ſecured to the rock by 36 iron cramps, part of them arranged in a circle about a foot within the external uprights, and the remainder, which were ſmaller cramps, in an interior circle three feet diſtant from the former, to hold down the floors of timber which had the ſtone beds between them. In the centre of the building a ſtrong maſt was erected, ſecured by two cramps to the rock at the bottom, and riſing above the ſolid to the height of 48 feet, being united to the framing of each floor it paſſed through, and thus forming a central axis to ſtrengthen the whole. The houſe above the ſolid contained four apartments, the lower being the ſtore room, the next the ſtate room, the third the bed chamber, and the fourth the kitchen, immediately beneath the lantern. In the manner of fixing the irons to the rock, upon the duration of which the ſecurity of the whole work depended, Mr. Rudyerd ſucceeded moſt admirably. The holes in the rock were made by drilling two holes rather diverging from each other, ſo that they would be an inch more aſunder at 15 or 16 inches depth, than on the ſurface of the rock. A third hole being drilled between theſe two, and the three being broken into one, formed a hole larger at the bottom than the top. The iron cramp was formed of two pieces, which, when laid together, were of the ſhape of the hole, but when ſeparated, one was larger at the bottom than the top, and the other ſmalleſt at the bottom; therefore the former being firſt put down into the hole, and the latter driven in by the ſide of it, wedged it faſt, and both being united by the ſame bolts which attached them to the timbers, rendered it impoſſible to draw them out. They were put in their places hot, and a quantity of melted tallow being firſt poured into the hole, when the hot irons were put down the tallow ran over on all ſides, and thus certainly filled up all cavities. A quantity of coarſe pewter, made red-hot, was now poured into the cavity round the irons, and, being a heavier fluid, diſplaced the tallow, and filled the ſpace round them completely, the tallow effectually preventing the entrance of the ſea water into the moſt minute cavities. This method is worthy of record, as it may be applied to many other uſeful purpoſes. Mr. Rudyerd, as before-mentioned, began his operations in July 1706; in July 1708, he had ſo far completed it as to exhibit a temporary light; and the whole was completed in the following year. This building had ſome repairs of its timbers in 1723, and again in 1744, when a violent ſtorm had carried away a great number of the upright timbers: but it ſhewed itſelf, in the courſe of 49 years, to be a very excellent conſtruction of its kind, and only liable to deſtruction from the periſhable nature of its materials, or the cataſtrophe which awaited it on the night of the 2d of Dec. 1755, when one of the attendants, entering the lantern to ſnuff the candles, found it in flames, and, notwithſtanding every exertion, the fire communicated to the uprights, and burned downwards. The unfortunate men deſcended

ſcended from room to room as the fire increaſed, and were at laſt obliged to take refuge, from the fall of burning timbers, in a cavity of the rock, from which they were relieved by a boat the next morning. The wind, unfortunately, blew from the eaſt, and though it cauſed ſuch a ſwell as to prevent landing, did not break on the houſe ſo as to extinguiſh the fire; and thus, in a few days, the whole was deſtroyed, except the iron cramps in the rock.

It is remarkable, that whilſt one of the light keepers, at the commencement of the fire, was looking up at the fire in the cupola of the lantern, a body of melted lead ſhowered down upon him, and he declared a quantity had paſſed down his throat into his ſtomach. He lived only 12 days after being taken on ſhore; and on opening the body, a maſs of lead was taken from the ſtomach, weighing more than ſeven ounces. The curious fact, of his having 12 days ſurvived ſo alarming an accident, was communicated by his attendant ſurgeon, Dr. Spry, to the Royal Society, but the circumſtance appeared ſo improbable, that it did not, at firſt, meet that credit, which future experiments on animals proved he was entitled to.

On the news of the fire reaching London, the proprietors (for by the ſale of Capt. Lovel's original leaſe, the property of the light-houſe was now in many hands,) immediately took meaſures to reſtore it, and appointed one of their members, Mr. Rob. Weſton, to the ſole management of their affairs, and he being recommended to Mr. John Smeaton, F.R.S., by the preſident of the Royal Society, employed this gentleman to deviſe the means, and ſuperintend the erection, of a new building. Mr. S., whoſe originality of genius, and ſoundneſs of judgment, have ſince been ſo generally known, was at that time juſt entering into his profeſſion as a civil engineer, but immediately devoted himſelf to the conſideration of the light-houſe, and ſoon determined upon erecting a ſtone building; and reaſoned, that by making the building very heavy, and uniting all the ſtones firmly together, he ſhould obtain ſuch a weight and ſtrength, as would firmly reſiſt the united action of the wind and water. He determined upon dovetailing the ſtones together, as being a more ſecure method than cramping with iron, and not liable to interruption from the work getting wetted, as would almoſt unavoidably happen in ſuch an expoſed ſituation. On the whole, the building he erected, and which is now ſtanding, may be conſidered as the moſt perfect light-houſe in exiſtence, and gives examples of the beſt kinds of maſonry. We have therefore given drawings of it in the *Plate* of *Light-houſe*, which are taken from a ſuperb work in folio, publiſhed by Mr. Smeaton in 1791, entitled "Narrative of the Building, and Deſcription of the Conſtruction of the Eddyſtone Light-houſe with Stone." It is from the ſame ſource the whole of this article has been compiled.

Fig. 1. is a ſouth elevation of the whole houſe, and *fig.* 2. a ſection of the ſame. A repreſents the landing place; B a natural cave in the eaſt ſide of the rock; D an iron rod, ſerving as a rail to hold by in paſſing up ſteps cut in the rock, to the foot of the ladder occaſionally put out from the entry door at E. At F is a caſcade of water, pouring over a low part of the rock, but this is only momentary, for the ſwell will in an inſtant cauſe it to ſet the other way. In *fig.* 2. *a* B ſhews the upright face of the rock, and the line *a b* the general direction of its *grain* or ſlope. In this figure it is ſeen that, as high as the firſt 14 courſes of ſtone work, the building is entirely ſolid. Here the entry F commences, but excepting this cavity, and the ſtaircaſe X, the ſolid ſtill continues to the floor of the loweſt chamber G, which is the ſtore room, and H the door at which the ſtores are drawn up and received. I is the upper ſtore room; K the kitchen containing the fire-place L, from which the ſmoke aſcends by a copper funnel *m*, through the bed room M and lantern N, to the ball on the top of the cupola O. The aſcent from room to room is by the perforations through the middle of each floor, a moveable ſtep ladder being uſed for the attendants; but ſtore may be drawn up from the lower room into any other. P is the railing forming the balcony; its floor is covered with very thick ſheet lead, turned down over the cornice Q, which ſurmounts the column of the building. R is the ſtone baſement of the lantern, and N the glazed part: the cupola O is ſupported by eight caſt-iron ſtandards, between which the copper window frames are fixed: the ſtandards have claws at bottom, which are ſcrewed to flat iron bars reſting upon the ſtone work. By this means the whole lantern is framed together; and to ſtrengthen it, the window frames are caſt with diagonal bars, as ſhewn in *fig.* 2. The whole lantern is held down by eight bolts at its angles, paſſing down through the balcony floor; one of theſe is ſeen at *d*: S is the door to the balcony. The lantern is lighted by 24 candles arranged in two iron circles, one ſix feet four inches diameter, containing 16 lights; and the other, three feet four inches diameter, holding eight candles. Theſe circles are ſuſpended by cords going over pullies, ſo that they mutually riſe and fall parallel, and counterbalance each other. By this arrangement either circle can be drawn down to ſnuff the candles, which is done every half hour, without loſing the whole light. Having thus deſcribed the general outline of the building, the minutia of its conſtruction comes next to be deſcribed, and the manner of uniting the ſtones compoſing it. The ſection, *fig.* 2, ſhews the ſeveral ſteps which were cut in the rock to engraft the ſtone work upon. *Figs.* 1, 2, 3, &c. denote the different courſes of ſtone, each of which makes a level ſurface with the ſtep it is fitted into. The ſeventh is the firſt complete courſe. *Fig.* 3. is a plan of the rock, ſhewing the courſes 1, 2, and 3, laid in their places, and exhibiting the dovetails which are cut in each ſtep to hold the ſeveral ſtones in their places; and theſe ſtones are ſo formed as to enlock the others with them in a manner which will prevent any ſtone quitting its poſition. The dark ſhaded ſtones are *moor* ſtones, while the lighter ſorts are Portland ſtone. *Fig.* 4. is a plan of the ſeventh or firſt complete courſe, ſhewing a central ſtone with four dovetails uniting it to four others, and theſe tying in the remainder. All the ſolid courſes are laid in this manner to the fourteenth, which, as before mentioned, completes the entire ſolid. Every courſe is laid in ſuch a manner upon the one beneath it, that all the joints break each other, as maſons term it, that is, immediately above and below the joints of any courſe the middle of a ſolid ſtone is diſpoſed. The ſeveral courſes are retained upon each other, to prevent them ſliding ſideways, by means of *joggles*, which are plugs or cubes of hard black marble, ſhewn by the dark ſquares in *fig.* 2, and in the plan, *fig.* 4, to be received one-half through every two adjacent courſes. All the courſes of the entire ſolids have a central joggle *f*, and eight others, *g*, arranged in a circle round it, as ſhewn in *fig.* 4. Above the entire ſolid, the centre ſtone is omitted to leave the well-hole for the ſtair-caſe, X, or rather, it is compoſed of four ſtones, united by hook or dovetail joints, to form, when put together, one piece, large enough to have the well-hole through its centre, and the exterior ſtones are united to it as a central piece in the ſame manner, as *fig.* 4. In theſe courſes the continuity of the ſtones being ſomewhat broken, double the number of joggles, *h*, and thoſe half the ſize, are introduced between the courſes. It is to be obſerved, that none of the joggles, except the centre ones, come immediately over the others, as the figure would infer, but they break joint with each other to give every part of the ſolid an equal ſtrength. Above the ſolid, a new ſyſtem of building was neceſſarily adopted: the lower courſes were compoſed of Portland ſtones to fill up the centre, and moor ſtones, as being more durable, to make the outſide. The whole of the upper works are of moor ſtone; and dovetailing being no longer practicable, the ſtones are united by iron cramps and joggles, as ſhewn in *fig.* 7, which is a plan of the upper or bed-room M. Each ſtone is here ſeen to have an iron cramp to join it to its neighbour, and has a ſmall marble joggle to unite it with that above it. The vertical joints are rendered impervious to water, by cutting a notch between every two adjacent ſtones, ſo that when they come together it forms a hole of a lozenge ſhape, and a piece of ſtone being put down into this hole with mortar, makes a perfect joint, at the ſame time increaſing the bond of the ſtones. This kind of joint is partly ſeen in *fig.* 8, at *n*, but one-half is hid by the iron cramps *r*, *r*, extending over every joint. In this figure they are ſeen inclined, that they may take firmer hold of the ſtones *s*, *s*, forming the ſides of the apertures T, for the window. The ſtones of the different floors are dovetailed together, as in *figs.* 5 and 7, and are rather arched on the lower ſide, as ſhewn in *fig.* 2. To retain the thruſt of theſe arches, every courſe from which a floor ſprings, is bound by an endleſs chain inlaid in the ſtone work, as in *fig.* 5, and run in ſolid with lead. The chain is ſhewn enlarged in *fig.* 6. *Fig.* 7. is a plan of the bed-room M, ſhewing the diſpoſition of the three cabin beds *k*, *l*, *m*, with a window between each. The dark ſpot *m* is the ſmoke funnel, and *n* is the place for a clock.—The reader is now tolerably well acquainted with the conſtruction of Mr. Smeaton's light-houſe; but in ſuch a peculiarly expoſed ſituation, every trifling operation was attended with difficulty, and demanded thought and ingenuity to deviſe the means of accompliſhing it. On this account we ſhall briefly follow Mr. Smeaton through his narrative, though it relates circumſtances which, if recorded in the account of a common building, would appear impertinently minute. The ſeaſon when Mr. Smeaton firſt took up the buſineſs of the light-houſe not being favourable for a viſit to the rock, he did not attempt it till April 1756, before which time he had deſigned the general principles of the building. He found upon the rock the irons of both the former erections, and ſeveral of the moor ſtones of the late building lying in the gut, which was a narrow channel of twelve feet deep between the houſe rock, and a reef of rocks to the weſtward, in which channel the boats coming to the houſe could lie in fair weather. His firſt viſit was employed in obſervations on the rock, and in experiments of the time requiſite to drill and pick holes of a certain dimenſion, that he might eſtimate the time neceſſary to complete the work on the rock. In ſucceeding voyages he took dimenſions of every part to enable him to make an accurate model, to which he could adapt a model of the intended building. The unfavourable days at ſea were employed on ſhore in examining the ſtone in the country round, a convenient ſituation for a work-yard, &c. The dimenſions of the rock were taken by the following means: He fixed up the circle of a theodolite, with its index, in the centre of the rock, and levelled it with the ſpirit-level; a light rod was fixed to the index, long enough, when turned round, to reach all parts of the rock; it was provided with a ſpirit-level to ſhew when it ſtood horizontal. It is obvious that this rod, when turned round, would deſcribe a horizontal plane, and the depth of any point of the rock beneath this plane was aſcertained by a rod ſet up vertically upon the point in queſtion, and applying the horizontal ruler to it. The diviſions on the vertical rod ſhewed the depth; and the diviſion of the horizontal ruler ſhewed the diſtance from the centre, and the degrees of the theodolite circle pointed out the direction. By theſe means the poſition and altitude of thirty-two principal points were obtained, which were well marked upon the rock, and a line being ſtretched from one of theſe points to another, gave the means of determining the poſition of the iron ſtanchions, or any thing elſe which was remarkable. Having thus, in ten voyages, made all the neceſſary obſervations on the rock, and determined upon regulations for the management of the work, he returned to London, and, in his way, viſited the various ſtone quarries in Devonſhire, and the iſles of Portland and Purbeck. He was employed, till the month of July, in making exact models of the building, when he returned to Plymouth, where he found a veſſel, the Neptune Buſs, which had been fitted up for exhibiting a temporary light during the period of rebuilding the houſe. From ſome miſunderſtanding between the Board of Trinity and the proprietors, this veſſel was not employed in this manner, but was devoted to Mr. Smeaton's uſe, who immediately began the works upon the rock; mooring the Buſs near the rock to ſerve as a retreat for the workmen, who were frequently driven off by the waves. In the month of September the three lower ſteps of the rock were completed, and the upper ones in a ſtate of great forwardneſs; after which time, bad weather prevented much more being done that year, and in November the Buſs left her moorings to return to Plymouth, in which voyage ſhe was driven to ſea, and narrowly eſcaped ſhipwreck. Thus concluded the operations of the year 1756. The winter ſeaſon was paſſed in preparing ſtone work on ſhore, in building boats, and, by Mr. Smeaton, in a long and valuable ſeries of experiments on the different kinds of cements, which could be applied to the building.

In May 1757, the Buſs was carried out and moored, and on the 12th of June the loweſt and firſt ſtone was laid in its place; from the great uncertainty of the weather every ſtone was ſo contrived, that it was of itſelf in a condition to reſiſt the waſh of the ſea, even when it was immediately laid, and before it was hardened. For this purpoſe, each ſtone had one or two holes drilled through it before it left the work-yard, and this hole being continued a few inches into the rock or the ſtone beneath, a ſtrong trenail, or oaken pin, was driven through it, to pin it faſt in its place: as the dovetails did not of courſe fit perfectly cloſe into each other, but left ſpace for the mortar; notches were cut in the edges of each ſtone to receive ſtrong oak wedges, which held them firm until the mortar came to its ſolidity. As a further precaution to defend the mortar, all the outward joints were coated over with plaſter of Paris, as a temporary expedient. The work went on rapidly in this manner, and the ſecond courſe was nearly ſet in a few days; but a gale ſprang up, which obliged them to quit the work, leaving a few ſtones of the ſecond courſe, which could not be ſet, lowered down into their places, and chained ſtrongly to the rock, by lines inſerted into the holes made in each of the ſtones, to lift them by; and one of the moſt expoſed was ſecured, by laying upon it, when in its dove-tail, a weight of lead of five cwt. in form of a hemiſphere. A ſtorm came on, and it was afterwards found, that this weight had been lifted by the waves, ſo that the ſtone beneath it had eſcaped and was loſt, as were four others, from which circumſtance the force of the ſea on the rock may be imagined. New ſtones were immediately prepared, and the work renewed. In the progreſs of the work, it conſtantly happened, after all precautions, that the cement was waſhed away in particular places, and it was always repaired the firſt opportunity with Pozzolana or Dutch terras; which repairs, if they withſtood one rough tide, were never found to fail afterwards; but ſome places were found ſo difficult, that it became neceſſary to mix oakum, chopped very ſmall, with the mortar, and this method always ſucceeded. On the 11th of Auguſt the ſix baſement courſes were completed, and the firſt entire courſe, N° 7, was begun. All the ſtones for this courſe were fitted and put together in the work-yard, as ſhewn in *fig.* 4. They are numbered, ſo that after being taken to pieces, they could be reſtored to the ſame relative poſition on the building; but to do this accurately, while they were in the work-yard, radial lines were drawn from the centre to the circumference, ſo as to interſect each ſtone; and concentric circles were drawn through the middle of each tier of ſtones. Where any of theſe lines croſſed the joints, a nick was ſawn in the edge of the ſtone, that the mark might be felt as well as ſeen; and by the coincidence of theſe lines the ſtones were ſet with the greateſt accuracy. On the ſtones arriving at the work, the central ſtone was firſt ſet; the hole to receive the centre joggle was cut through the centre of courſe ſix, and the joggle ſet up therein, as ſhewn in *fig.* 2, and the centre ſtone of courſe ſeven let down upon it, a mortar bed being made beneath. When the ſtone was thus fixed, the joints round the joggle were filled in by grouting, which is mortar made very thin and poured in from ladles. The four ſtones ſurrounding the centre were now ſet, and the work proceeded thus to the circumference, every ſtone being wedged and trenailed as ſoon as ſet, and the joints grouted. To fix the eight ſmaller joggles, they were ſet, wedged, and grouted into their holes in the lower courſe; but the holes for their reception in the lower ſide of the upper courſe, being only cut half through, did not admit of wedging; they were therefore fixed by the mortar only, as much being put on the top of the joggle as would nearly fill the hole, but not quite, and the remainder was introduced through a hole previouſly drilled through the ſtone, and forced down by a wooden ramrod.

The mortar uſed in the building was compounded of equal portions of lime and pozzolana. The lime was burned from the blue Lyas limeſtone found near Watchet, a ſmall ſeaport in Somerſetſhire. It was carried out in tight caſks, which were opened at the rock, and a ſmall quantity beat up in a ſtrong bucket with a wooden peſtle, and uſed immediately. The work proceeded in the ſame manner without any deviation or accident, except now and then loſing a few ſtones by ſtorms, until the end of September, when the ninth courſe, being completed, the work was given up for the year, and the Buſs left her moorings.

During the winter, the buoy of the moorings for the Buſs was loſt, but was recovered on the 11th of May, 1758. Yet, before any work could be begun, the chains were broken, and the buoy of the anchors having got looſe, the moorings were loſt; much time being conſumed in preparing new ones, it was the 2d of July before the work was renewed; but by the 8th of Auguſt, the 14th courſe, completing the entire ſolid, was laid, and by the 20th the entry door was covered in, and by the 24th of September, the whole of the ſolid, up to the ſtore-room floor, was finiſhed. Above this the method of working was totally altered, but not being now ſo liable to the action of the ſea, it became leſs difficult, and requires leſs deſcription. In addition to what has been ſaid before, the iron cramps were all filled in their places with lead, and a whole courſe was done at once, by putting each cramp into a kettle of red-hot lead, till it was equally hot. A ſmall quantity of oil was poured into the holes in the ſtone, and the hot cramp put in: this oil cauſed the lead, when poured in, to occupy every cavity in the ſtone.

On the 30th of September, the work had arrived at the ſtore-room floor, and here the iron chain, ſhewn in *fig.* 5, was let into the ſtone, and filled in with lead in the following manner:—the chain was oiled before putting it in, and the groove divided into four parts by dams of clay. Two kettles were uſed, which together would hold lead enough to fill the whole groove, which was 11 cwt. In theſe the lead was made red-hot, and two perſons with ladles filled the lead into the ſame quarter of the groove. As ſoon as it was at all ſet, they removed one of the clay dams, and filled the next quarter, pouring the lead on the end of the firſt quarter, till it re-melted and united with the ſecond. The dam at the oppoſite end of the firſt quarter was now removed, and the third filled, and then the 4th. By this means the lead was all round united in one maſs.

The centering for the floor was next ſet up, and the floor partly put together, the outward ſtones being ſet firſt, and then the centre ones. When the firſt room had been thus finiſhed, Mr. Smeaton propoſed exhibiting a temporary light during the winter, and, by fixing three floors in the well for the ſtaircaſe, to form ſtore rooms, and lodging for two men: but this idea was given up, as it did not meet the approbation of the Trinity corporation, and the work was, on the 7th of October, left for the year, the floor being partly finiſhed. The winter was ſpent in preparing the iron, glaſs, and copper work for the lantern; and the ſpring in unſucceſsful endeavours to recover the moorings which were again loſt, and on the 5th of July the work was begun again. They found one of the ſtones for the floor, which was lodged in the ſtore room H the year before, had been waſhed down the well, and thence through the entry into the ſea, though it weighed four or five cwt. The ſtones for the building had hitherto been raiſed out of the boats, by what are termed *ſhears*, formed of two poles, united at top, and their feet pitched on the rock cloſe to the building, at a proper diſtance aſunder. A block of pullies was ſuſpended from the top of the two beams, to take up the ſtone. The ſhears were ſupported by a tackle called a guys, which was attached to the top of the ſhears, and hooked to the far ſide of the building, ſo that the ſtone, being raiſed up from the boat by a windlaſs fixed on the rock at Y, *fig.* 1, the guy was drawn in to ſwing the ſtone over the building. When the work got above the entry E, the ſtones were landed into it, and drawn up the well X by a tackle ſuſpended from a ſmall triangle ſet over the well; but when the floor was covered in, the hole in the centre being too ſmall to let the ſtones come up, a ſmaller pair of ſhears were made to lie upon the building and riſe as it advanced. Theſe were worked by a windlaſs ſet up in the ſtore room H, and as they hung over the ſides of the building, they drew up the ſtones clear of the wall. The work proceeded in this manner till the 17th of Auguſt, when the laſt piece of the cornice Q was fixed, which completed the whole column, and the workmen were enabled to lodge in the building. The balcony rails P, and the ſtone baſement R of the lantern, were ſoon completed; and by the 26th, the ſtairs and all the maſonry were finiſhed. The iron frame of the lantern was next ſcrewed together in its place, all the joints being firſt ſmeared with thick white lead and oil to prevent them from ruſting: it was then raiſed up on wedges a ſmall height, and lead poured in the joint between it and the ſtone to make a ſolid bed for it upon the ſtone. On the 17th of September, the copper cupola O was ſet up, by a particular kind of ſhears made for the purpoſe, the guys, in different directions, being faſtened to booms projected out from the ſeveral windows of the upper room. The next day the ball, which was double gilt, was ſcrewed on; and by October the 16th, an electrical conductor was fixed, which finiſhed the edifice. A light was then exhibited, which has been continued ever ſince without any particular occurrence, or any accident produced by the many violent ſtorms which have happened ſince. Mr. Smeaton has, in the title page of his narrative, given a repreſentation of the houſe in a ſtorm, as ſeen through a teleſcope from Plymouth, when the waves daſh up againſt the building, till they meet the cornice Q, by which the water is thrown off in all directions in a white column, which envelopes the houſe like a ſheet, and riſes to at leaſt double its height, though the top of the ball is 100 feet above low water. See BEACONS.

LIGHT *Infantry.* See INFANTRY. When the light infantry companies are in line with their battalions, they are to form and act in every reſpect as a company of the battalion; but when otherwiſe diſpoſed of they may looſen their files to ſix inches.

The open order of light infantry is uſually two feet between each file.

The files may be extended from right, left, or centre; in executing it, each front rank man muſt carefully take his diſtance from the man next to him on that ſide from which the extenſion is made: the rear rank men conform to the movement of their file leaders.

When light infantry men fire in extended order, it is to be a ſtanding rule, that the two men of the ſame file are never unloaded together; for which purpoſe, as ſoon as the front rank man has fired, he is to ſlip round the left of the rear rank man, who will take a ſhort pace forward, and put himſelf in the other's place, whom he is to protect while loading.

The extended order of light infantry varies according to circumſtances and ſituations. They may ſometimes looſen their files to three times the diſtance of open order. But the general rule is to allow convenient intervals for the rear rank men to ſlip by, and return after they have fired.

All movements of light infantry, except when firing, advancing, or retreating, are to be in quick time.

The officer commanding the company will be on the right, covered by a ſerjeant; the next on the left, alſo covered by a ſerjeant. The youngeſt officer in the rear. In extended order the poſt of the officers and ſerjeants is always in the rear at equal diſtances.

In marching by files the officer commanding leads: by diviſions each officer leads one. The ſupernumerary officer, if there be one, is in both caſes with the officer commanding, ready to obey any directions he may receive from him.

The arms of light infantry in general will be carried ſloped and with the bayonet fixed. Flanking or advanced parties, however, or parties in particular ſituations, may carry them trailed, and without bayonets, for the purpoſe of taking a more cool and deliberate aim.

When the light infantry is ordered to cover the line to the front, the diviſions will move from their inner flanks round the flanks of the battalions, and when at the diſtance of fifty paces, the leading flanks will wheel towards each other, ſo as to meet oppoſite the centre of the battalion, opening their files gradually from the rear, ſo as to cover the whole extent of the battalion.

The files are not to wait for any word of command, but to halt and front themſelves. In this poſition, and in all poſitions of extended order, the poſt of the officer commanding is in the rear of the centre, and the movements are to be regulated by the company belonging to the battalion, which governs thoſe of the line. For a fuller explanation of light company manœuvres, ſee page 273 to page 281 of Infantry Regulations.

Light infantry men, like huſſars, are frequently detached to act as ſcouts on the flanks, in the front, or with the rear guard of the body of troops to which they belong. They then acquire the appellation of ſkirmiſhers, and being previouſly told off for that ſpecific duty, they advance and form in the front in rank entire; which is effected by each man from the rear rank placing himſelf on the left of his file leader. The rank entire may be reſorted to for various purpoſes during the movements of one or more battalions, ſince it may ſerve not only to cover them from the enemy's obſervation, but in ſome caſes, eſpecially in foggy weather, will itſelf appear a larger body than it really is. Too much attention cannot be given to the organization of light troops on foot. They are very properly called the eyes of an army, and ought always to be conſidered as indiſpenſably neceſſary.

LIGHT-*Room,* is a ſmall apartment incloſed with glaſs windows, near the magazine of a ſhip of war. It is uſed to contain the lights by which the gunner and his aſſiſtants are enabled to fill the cartridges with powder, to be ready for action.

LIGHT *Troops,* in *Military Language,* generally denote all horſe and foot which are accoutred for detached ſervice.

LIGHT *Water-line,* in *Naval Architecture,* the line of floatation of the ſhip, before ſhe takes in her cargo.

LIGHTEN, in the *Manege.* To lighten a horſe, or make him light in the fore-hand, is to make him freer and lighter in the fore-hand than behind. If you would have your horſe light, you ought to keep him always diſpoſed to a gallop, when you put him to a trot; and after gallopping ſome time, you ſhould put him back to the trot again.

LIGHTER, a large open veſſel, generally managed with oars, common on the river Thames, and on other rivers and canals; where it is uſed for the carriage of timber, coals, ballaſt, and any goods to or from a ſhip, when ſhe is to be laden or delivered. There are alſo ſome lighters furniſhed with a deck throughout, in order to contain thoſe merchandizes which would be damaged in rainy weather: theſe are uſually called *cloſe-lighters.* See BOAT.

LIGHTER-*Men.* See COMPANY.

LIGHTFOOT, JOHN, in *Biography,* the ſon of a clergyman, was born at Stoke upon Trent, in Staffordſhire, in the year 1602. He received his grammar learning at Moreton-green, near Congleton, Cheſhire, after which he was entered a ſtudent of Chriſt's college, in the univerſity of Cambridge. Here he applied himſelf with much diligence, and made ſo great a proficiency in claſſical literature, and the ſtudies connected with it, that he was reckoned the beſt orator among the under graduates of the univerſity. At the age of nineteen he quitted the univerſity, and engaged himſelf as aſſiſtant to his old ſchool-maſter, who had, at that time, removed from Cheſhire to Repton in Derbyſhire. Having continued in this ſituation about two years, he took orders, and ſettled as curate at Norton-under-Hales, in Shropſhire: about the ſame time he became chaplain to ſir Rowland Cotton, and reſided in his family. This gentleman, being a perfect maſter of the Hebrew tongue, engaged Mr. Lightfoot in the ſtudy of that and the other Oriental languages. He followed his patron to London, and would have proceeded with him to the continent, but the living of Stone, in Staffordſhire, being offered him, he preferred ſettling there, as it like-which gave him an opportunity of entering upon the marriage ſtate, which he immediately embraced. Here he found the means of ſtudy exceedingly ſcanty, and in the courſe of a few months reſigned the living of Stone, and removed to Hornſey, near London, a ſituation which he choſe, on account of its vicinity to the metropolis, where the ſources of learning were very abundant. He was now a frequent attendant at the library of Sion-college, which afforded him the moſt ample means of ſupplying all his literary wants. In 1629, Mr. Lightfoot publiſhed his firſt piece, entitled "Erubhim; or Miſcellanies Chriſtian and Judaical, and others, penned for the recreation of vacant hours." In 1630, he was preſented by ſir Rowland Cotton to the rectory of Aſhly, in Staffordſhire, and immediately removed to his pariſh, in which he lived twelve years, applying himſelf with indefatigable diligence in ſearching the ſcriptures, and in the performance of various duties attached to his office, as a conſcientious clergyman. He was next appointed by the Long Parliament a member of the aſſembly of divines at Weſtminſter; and as he could no longer reſide among his pariſhioners he reſigned the rectory, but obtained the preſentation for a younger brother. He arrived in London in 1642, and was almoſt immediately choſen miniſter of St. Bartholomew's, behind the Royal Exchange. In the aſſembly of divines, which met in June 1643, Mr. Lightfoot became diſtinguiſhed for his eloquence in debate, and activity in buſineſs. He was friendly to the Preſbyterian form of church government, which he declared in a ſermon before the houſe of commons, he verily believed was "according to the pattern in the mount." In 1643 he was appointed maſter of Catherine-hall, in Cambridge, and in the ſame year he was preſented to the living of Much-munden, in Hertfordſhire. In 1644 he publiſhed the firſt part of his "Harmony of the New Teſtament," with a plan of his whole deſign, and continued afterwards to ſend out, at different periods, the other branches of the ſame work. In 1652, Mr. Lightfoot took the degree of doctor of divinity, and went through all the regular exerciſes, on that occaſion, with great applauſe. In 1653 he was choſen vice-chancellor of the univerſity of Cambridge, the duties of which important office he performed with exemplary diligence and fidelity. Upon the reſtoration of king Charles II. Dr. Lightfoot offered to reſign the maſterſhip of Catherine-hall in favour of Dr. Spurſtow, but upon his declining to accept it, our author obtained a confirmation from the crown of that place, and of his living. For theſe marks of royal favour he was chiefly indebted to the kindneſs of archbiſhop Sheldon, who, out of pure reſpect for his learning and talents, undertook to ſerve him. Soon after this he was collated, through the intereſt of lord-keeper Bridgman, to a prebend in the cathedral church of Ely. In 1661 he was appointed one of the aſſiſtants at the conference at the Savoy on the ſubject of the liturgy, but he attended only twice, on account of the violence diſplayed in the debates. He now gladly withdrew as much as poſſible from the world, in order that he might ſpend his time in ſtudies to which he was attached, and which he proſecuted with vigour to the laſt. His publications would have been more numerous, but the expence of them was more than he could bear, and he never was ſufficiently patronized by the public to intereſt the bookſellers in his behalf. A ſhort time before his death he was, however, requeſted by them to collect and methodiſe his works, in order that they might be printed in an uniform manner. He died in December 1675, before he could accompliſh the taſk required of him, in the 74th year of his age. Dr. Lightfoot was indefatigable in his purſuits, and extremely temperate in his mode of living. He lived in the greateſt harmony among his pariſhioners, being eaſy of acceſs, affable, communicative, hoſpitable, and charitable. As a writer he was one of the moſt ingenious, as well as learned, of our Engliſh commentators, and has furniſhed his ſucceſſors with very valuable materials in the ſame line of ſtudies: he had few equals, and no ſuperior in rabbinical literature; and in this branch of learning his celebrity was ſo great, that many foreigners came to him for aſſiſtance in it. His works were collected and publiſhed in 1684, in two volumes folio. A new edition of them was publiſhed in Holland in 1686, containing all his writings that had been originally given to the world, in the Latin language, and a Latin tranſlation of thoſe which he had written in Engliſh: and a third edition was publiſhed at Utrecht in 1699, by John Leuſden: this impreſſion contained ſome poſthumous pieces, which were compriſed in a third volume. Theſe were, in the following year, publiſhed in an 8vo. volume by Mr. Strype, under the title of "Some genuine Remains of the late learned and pious Dr. John Lightfoot." The doctor was not only indefatigable in his own purſuits, but an encourager of other learned men in their's. He gave great aſſiſtance in completing the Engliſh Polyglott bible, by drawing up a chorographical table prefixed to it, and by ſuperintending the ſheets of the Samaritan verſion, as they were printed: he afforded much pecuniary aſſiſtance to Dr. Caſtell in the publiſhing of his Heptaglott Lexicon, which would otherwiſe have occaſioned his entire ruin for want of ſupport from the learned world: and Dr. Lightfoot was the perſon who excited Mr. Pool to undertake his valuable work entitled "Synopſis Criticorum." Biog. Brit. Gen. Biog.

LIGHTFOOT, JOHN, a diſtinguiſhed Britiſh botaniſt, chiefly known as the author of the *Flora Scotica*, was born in 1735. He was educated at Oxford, where he took the degree of Maſter of Arts, and having entered into holy orders, became chaplain to the late ducheſs dowager of Portland, "that great and intelligent admirer and patroneſs of natural hiſtory in general," as he juſtly denominates her in the dedication of his book. He was recommended to this illuſtrious lady, whoſe accompliſhments gave a luſtre to her high rank, by his taſte for botany and conchology, as well as his courtly and aſſiduous manners, which, accompanied by an habitual pleaſantry and cheerfulneſs, rendered his company generally acceptable. By her grace's influence, we believe, he obtained the rectory of Gotham, in Nottinghamſhire, and ſubſequently the living of Cowley, in Middleſex.

In 1772, the late Mr. Pennant, ſo well known as a zoologiſt, invited Mr. Lightfoot to be the companion of his ſecond tour to Scotland and the *Hebrides*, adviſing him to undertake the "compilation," as he himſelf modeſtly calls it, of a *Flora Scotica*, which Mr. Pennant offered to uſher into the world at his own expence. Theſe generous and flattering offers Mr. Lightfoot gladly accepted, and made the moſt of the opportunity afforded him for "gratifying a favourite affection he had long conceived for the ſcience of botany." He enjoyed "the enchanting proſpect," to uſe his own words, "of examining a country whoſe vegetable productions had been attended to by very few." Our author was juſtly aware that a ſingle ſummer could by no means be ſufficient for the full accompliſhment of ſuch an undertaking, nor would he perhaps have ventured upon it, but for the aſſiſtance of "able and ingenious botaniſts, who had reſided in that country their whole lives," who permitted him "to examine their collections, and freely communicated the obſervations of many years." Theſe were the late Dr. Hope, profeſſor of botany at Edinburgh; the Rev. Mr. (now Dr.) John Stuart of Luſs; and the Rev.

Dr. Burgeſs, the venerable paſtor of Kirkmichael in Dumfriesſhire: three men whoſe urbanity conferred upon their beloved ſcience her moſt attractive charm, as the writer of this can well teſtify. Mr. Stuart was the companion of our travellers in their excurſion, and ſupplied each, in his own line, with much learned information, reſpecting the Erſe nomenclature, as well as the real or ſuppoſed uſes and hiſtory of the native animals and plants. Thus Mr. Pennant was enabled to prefix a compendious *Fauna* to the *Flora* of his friend; and thus Mr. Lightfoot found his path made ſtraight and plain before him, and literally ſtrewed with flowers. He profited likewiſe from the communications of Dr. Parſons, at that time profeſſor of anatomy at Oxford, and of Mr. Yalden, an ingenious young man, whoſe premature death happened ſoon after. Theſe gentlemen had cultivated botany in the courſe of their medical ſtudies at Edinburgh, the latter eſpecially, with eminent ſucceſs. When Mr. Lightfoot's materials were got together, the library, herbarium, and perſonal ſuperintendance, of his friend ſir Joſeph Banks, in conjunction with the help of Dr. Solander, were of the moſt eminent and indiſpenſable uſe; and the compariſon of his cryptogamic ſpecimens with thoſe of Dillenius at Oxford, under the eye of the profeſſor, or rather of his ſon Dr. John Sibthorp, gave the finiſhing ſtroke to his labours. Thus the *Flora Scotica* became ready for publication in 1777, when it appeared in two thick volumes 8vo. with 35, rather indifferently engraved plates, five of which are zoological. The work is diſpoſed according to the ſyſtem of Linnæus, with ſhort eſſential generic and ſpecific characters copied from that author, and references to a few of the beſt figures of each ſpecies. Engliſh, Scottiſh, and Erſe names are ſubjoined, with the general or particular places of growth, duration, &c.; and the account of every plant finiſhes with a longer or ſhorter deſcription in Engliſh, various botanical remarks, and compiled notes of its economical or medical uſes.—The plan and the execution of this work appear calculated to render it one of the moſt popular Floras. It has found its way to the continent, where it is generally quoted, eſpecially for the Cryptogamous claſs, which the author ſays "coſt more time and attention than all the other 23 claſſes together." Yet we have heard that this publication did not, for a long time at leaſt, pay its expences. This certainly did not ariſe from any want of merit; for its only great and radical fault was not known, or at leaſt ſcarcely conſidered ſuch, till lately. Of this notice is taken under the botanical article FLORA. The fault we mean is the compiling deſcriptions from foreign authors, without mentioning whence they are taken; ſo that a ſtudent can never be certain of their juſt application, but, on the contrary, often finds them erroneous or unſuitable, without knowing why. Even in the laſt claſs, on which Mr. Lightfoot beſtowed ſo much pains, the ſynonyms of Linnæus and Dillenius often diſagree, though in many caſes ſuch contrarieties are properly indicated, ſo as to throw original light on the ſubject.

Mr. Lightfoot was for ſome years a fellow of the Royal Society, and was one of the original fellows of the Linnæan Society, the formation of which he contemplated with great pleaſure, though his death happened before he could attend any of its public meetings. Having married the daughter of an opulent miller at Uxbridge, he reſided in that town, and died there ſuddenly in the ſpring of 1788, aged 53, leaving a widow and ſeveral daughters. He was buried in Cowley church, where his grave remained, for ſome time at leaſt, without any memorial. He is ſuppoſed never to have recovered from a diſappointment, reſpecting a living, which his patron, the late duke of Portland, ſolicited from lord chancellor Thurlow, but which the latter did not think fit to beſtow.

The ſubject of our memoir had, in the courſe of his botanical ſtudies, collected an excellent Britiſh herbarium, conſiſting of abundant ſpecimens, generally gathered wild, and in many caſes important for the illuſtration of his work. He had alſo amaſſed, from ſir Joſeph Banks and other friends, a number of exotic plants. The whole was bought, after his death, for 100 guineas, by his majeſty, as a preſent to the queen, and depoſited at Frogmore, the price being fixed by an intelligent friend of the family. The ſpecimens having been for ſome time neglected, were, after a while, diſcovered to be much infeſted with inſects; and as their royal poſſeſſor, having a genuine and ardent taſte for the ſtudy of botany, was anxious for their preſervation, the writer of the preſent article was requeſted to give his advice and aſſiſtance on this ſubject. This led to his frequent invitation as a viſitor at Frogmore, and to a regular courſe of converſations, rather than lectures, on botany and zoology, which her majeſty, and the princeſſes Auguſta and Elizabeth honoured with their diligent attention; the queen regularly taking notes of every lecture, which ſhe read over aloud at its concluſion, to prevent miſtake. The plan of this exemplary mother, on which ſhe has often been heard to deſcant, was, in the education of her royal offspring, to open as many reſources to them as poſſible, in a variety of ſtudies and purſuits; out of which they might ſubſequently make their own choice, and thus be independent of circumſtances for occupation and amuſement. Nor has the herbarium of Lightfoot been conſigned to uſeleſs repoſe. It was allowed to be conſulted frequently, on the ſubject of Scottiſh Willows, and other doubtful matters, while the *Flora Britannica* was preparing; and the preſent biſhop of Carliſle was permitted to make all requiſite uſe of it, for the completion of his valuable paper on Britiſh *Carices*, printed in the ſecond volume of the Linnæan Society's Tranſactions. In the knowledge of theſe two genera of plants, Mr. Lightfoot excelled moſt botaniſts of his day; but the ſpecimens of Linnæus, being compared with his, have brought errors to light, which were never ſuſpected before. S.

LIGHTFOOTIA, in *Botany*, ſo named by L'Heritier, in honour of the author of the *Flora Scotica*. (See LIGHTFOOT.) L'Herit. Sert. Angl. 4. Ait. Hort. Kew. v. 1. 217. ed. 2. v. 1. 343. Willd. Sp. Pl. v. 1. 887. Juſſ. 450.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Campanaceæ*, Linn. *Campanulaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth of five equal, acute leaves, broad at the baſe, encompaſſing the middle of the germen. *Cor.* of one petal, in five deep, equal, regular, oblong, ſpreading ſegments, rather longer than the calyx; the very ſhort tube cloſed by five valves, bearing the ſtamens. *Stam.* Filaments five, linear, flat, equal, much ſhorter than the corolla; anthers ſmall, roundiſh, incumbent. *Piſt.* Germen half inferior, ovate, ſtyle thread-ſhaped, about the length of the corolla; ſtigma dilated into three or five, ſomewhat ſpreading, ſegments. *Peric.* Capſule ovate, with three or five cells, opening at the top by as many valves. *Seeds* numerous, ſmall, roundiſh.

Eſſ. Ch. Corolla in five deep ſegments, cloſed at the bottom by valves bearing the ſtamens. Calyx of five leaves. Stigma of three or five lobes. Capſule half ſuperior, of three or five cells, and as many valves.

1. L. *oxycoccoides*. Cranberry-leaved Lightfootia. L'Herit. Sert. Angl. 4. t. 4. Sm. Exot. Bot. v. 2. 19. t. 69.—(Lobelia tenella; Linn. Mant. 120. Thunb. Prodr. 40. L.
parviflora;

parviflora; Berg. Cap. 345.)—Leaves plain, ovato-lanceolate, alternate, reflexed. Stigma three-cleft. Corolla widely ſpreading.—Native of the Cape of Good Hope, as are the two following ſpecies alſo. This was ſent to Kew in 1787, by Mr. F. Maſſon. It is kept in the greenhouſe, and flowers from July to September. The *ſtem* is perennial, ſhrubby, of humble growth, buſhy and ſpreading, not proſtrate, very much branched, often finely downy. *Leaves* numerous, ſmall, alternate, ſeſſile, reflexed, ovate or ſomewhat lanceolate, acute, ſmooth, thick-edged, entire, except a ſmall glandular tooth or two at each ſide. *Flowers* ſmall, on little, terminal, naked, ſimple ſtalks. *Corolla* white, with a tinge of purple along the middle of each ſegment. *Stigma* purple. *Capſule* of three pointed valves forming a cone.

2. L. *tenella.* Curve-leaved Lightfootia. (Campanula tenella; Linn. Suppl. 141.)—Leaves ovato-lanceolate, channelled, cluſtered, recurved. Stigma three-cleft. Corolla widely ſpreading, with narrow linear ſegments. Stigma three-cleft. Gathered by Thunberg at the Cape. It ſeems a ſtranger to our gardens. L'Heritier confounded it with the preceding, from which it differs in its very numerous, cluſtered, recurved, and deeply channelled *leaves*, and the longer and narrower ſegments of the *corolla*. We cannot but think it more than a variety, though there is ſcarcely any difference beſides what we have mentioned.

3. L. *ſubulata.* Awl-leaved Lightfootia. L'Herit. Sert. Angl. 4. t. 5.—Leaves awl-ſhaped. Calyx almoſt altogether inferior. Corolla moderately ſpreading, with linear ſegments. Stigma five-cleft.—Sent to Kew by Mr. Maſſon in 1787, from the Cape.—This is diſtinguiſhed by its copious, awl-ſhaped, very narrow *leaves*, ſometimes near an inch long. The ſhrubby *ſtem*, with downy *branches*, accords nearly with the two former. The *flowers* ſtand on ſhorter ſtalks, and have longer ſharper calyx leaves, tumid at the baſe, and almoſt perfectly inferior. Segments of the *corolla* moderately ſpreading, recurved, narrow, white or blueiſh. *Stigma* five-cleft. *Capſule* we preſume of five valves.

Nothing can agree more exactly with this as to habit than *Campanula paniculata*, Linn. Suppl. 139, and *Trachelium diffuſum*, 143; but their corolla has a long tube. The capſule of this ſuppoſed *Campanula* has five valves opening at the top, exactly as in *Lightfootia*, not by pores laterally, and the calyx is half ſuperior, ſo that it certainly belongs to the ſame genus, the length of the tube of the corolla being of much leſs importance.

Lightfootia is alſo the name of an arboreſcent genus of the *Polyandria Monogynia*, in Swartz's Fl. Ind. Occ. v. 2. 947, referred to *Prockia* in Willd. Sp. Pl. v. 1. 1214. This is *Lightfootia* of Mart. Mill. Dict. v. 3.

LIGHTNESS. See Levity.

LIGHTNING, in *Phyſiology*, is a large bright flame, darting ſwiftly through the air, and extending every way to a conſiderable diſtance, of momentary duration, and commonly attended with thunder. Some have accounted for this phenomenon by ſuppoſing, that, from the particles of ſulphur, nitre, and other combuſtible matter, which are exhaled from the earth, and carried into the higher regions of the atmoſphere, is formed an inflammable ſubſtance, which, when a ſufficient quantity of fiery particles is ſeparated from the vapour buoyed up into the air, with theſe particles adhering to them by the colliſion of two clouds or otherwiſe, takes fire, and ſhoots out into a train of light, larger or leſs, according to the ſtrength and quantity of the materials. Others have explained lightning by the fermentation of ſulphureous ſubſtances with nitrous acids: ſee Thunder. But in the preſent advanced ſtate of the ſcience of electricity, this is univerſally allowed to be an electrical phenomenon. Philoſophers had not proceeded far in their experiments and inquiries on this ſubject, before they were ſtruck with the obvious analogy between lightning and electricity, and they produced many arguments, *à priori*, to aſcertain their ſimilarity. But the method of verifying this hypotheſis was firſt propoſed by Dr. Franklin, who, towards the cloſe of the year 1749, conceived the practicability of drawing lightning from the clouds: having found, by previous experiments, that the electric fluid is attracted by points, he apprehended, that lightning might likewiſe poſſeſs the ſame property; though the effects of the latter muſt, in an aſtoniſhing degree, ſurpaſs thoſe of the former. The other circumſtances of reſemblance between lightning and electricity remarked by this ingenious philoſopher, and abundantly confirmed by later diſcoveries, are the following: flaſhes of lightning, he obſerved, are generally ſeen crooked and waving in the air; and the electric ſpark drawn from an irregular body at ſome diſtance, and when it is drawn by an irregular body, or through a ſpace in which the beſt conductors are diſpoſed in an irregular manner, always exhibits the ſame appearance.

Lightning ſtrikes the higheſt and moſt pointed objects in its way, preferable to others, as high hills, trees, ſpires, maſts of ſhips, &c. and all pointed conductors receive and throw off the electric fluid more readily than thoſe which are terminated by flat ſurfaces. Lightning is obſerved to take the readieſt and beſt conductor; and this is the caſe with electricity in the diſcharge of the Leyden phial; whence the doctor infers, that in a thunder ſtorm, it would be ſafer to have one's clothes wet than dry. Lightning burns, diſſolves metals, (ſee Fusion,) rends ſome bodies, has been often known to ſtrike people blind, deſtroys animal life, deprives magnets of their virtue, and reverſes their poles; and theſe are well-known properties of electricity.

Lightning not only gives polarity to the magnetic needle, but to all bodies that have any thing of iron in them, as brick, &c.; and by obſerving which way the poles of theſe bodies lie, it may be known, with the utmoſt certainty, in what direction the ſtroke paſſed. Signior Beccaria ſuppoſes, that perſons are ſometimes killed by lightning, without being really touched by it; a vacuum of air only being ſuddenly made near them, and the air ruſhing out of their lungs to ſupply it; and with ſo much violence that they could never recover their breath. In proof of this opinion he alleges, that the lungs of ſuch perſons are found flaccid; whereas, when they are properly killed by the electrical ſhock, the lungs are found inflated: but this hypotheſis is controverted by Dr. Prieſtley. In order to demonſtrate the identity of the electric fluid with the matter of lightning, by actual experiment, Dr. Franklin contrived to bring lightning from the heavens, by means of an electric kite, which he raiſed, when a ſtorm of thunder was perceived to be coming on; and with the electricity thus obtained, he charged phials, kindled ſpirits, and performed all other electrical experiments, which are uſually exhibited by an excited globe or tube. This happened in June, 1752, a month after the electricians in France, of whom the moſt active were Meſſrs. Dalibard and Delor, followed by Mr. Mazeas and M. Monnier, purſuing the method which he had propoſed, had verified the ſame theory; but without any knowledge of what they had done. In April and June, 1753, he diſcovered that the air was ſometimes electrified poſitively, and ſometimes negatively; and found that the clouds would change from poſitive to negative electricity ſeveral times in the courſe of one thunder-guſt. He ſoon perceived that this important diſcovery was capable of being applied to practical uſe, and propoſed a method, which he ſoon accompliſhed, of ſecuring buildings from being damaged by lightning, by means of conductors. The Engliſh philoſophers had not been leſs attentive to this ſubject than their neighbours on the continent; but for want of proper opportunities for trying the neceſſary experiments, and from ſome incidental circumſtances that were unfavourable, they had failed of ſucceſs. However, in July, 1752, Mr. Canton ſucceeded; and in the following month, Mr. Wilſon and Dr. Bevis obſerved nearly the ſame appearances which Mr. Canton had obſerved before. Mr. Canton alſo ſoon after obſerved, in a number of experiments, that ſome clouds were in a poſitive and ſome in a negative ſtate of electricity; and that the electricity of his conductor would ſometimes change from one ſtate to the other, five or ſix times in leſs than half an hour. This variable ſtate of thunder clouds was diſcovered by S. Beccaria, before he heard of its having been obſerved by Dr. Franklin, or any other perſon: and he has given a very exact and circumſtantial account of the external appearances of theſe clouds. From his obſervations of the lightning abroad, and of his apparatus within doors, he inferred, that the quantity of electric matter, in an uſual ſtorm of thunder, is almoſt inconceivably great, conſidering how many pointed bodies, as trees, ſpires, &c. are perpetually drawing it off, and what a prodigious quantity is repeatedly diſcharged to or from the earth. This quantity is ſo great, that he thinks it impoſſible for any cloud or number of clouds to contain it all, ſo as either to diſcharge or receive it. Beſides, he obſerves, that, during the progreſs and increaſe of the ſtorm, though the lightning frequently ſtruck to the earth, the ſame clouds were the next moment ready to make a ſtill greater diſcharge, and his apparatus continued to be as much affected as ever; and, therefore, the clouds muſt have received at one place, in the ſame moment when a diſcharge was made from them in another: and, upon the whole, he infers, that the clouds ſerve as conductors to convey the electric fluid from thoſe places of the earth that are overloaded with it, to thoſe which are exhauſted of it. This electric matter, the riſe of which, from the earth into the higher regions of the atmoſphere, is aſcertained by the great quantities of ſand, aſhes, and other light ſubſtances, carried up with it, and ſcattered uniformly over a large tract of country, wherever it iſſues, attracts to it, and bears up with it the watery particles that are diſperſed in the atmoſphere. It aſcends into the higher regions of the atmoſphere, being ſolicited by the leſs reſiſtance it finds there than in the common maſs of the earth, which, at theſe times, is generally very dry, and conſequently highly electric. The ſame cauſe which firſt raiſed a cloud, from vapours diſperſed in the atmoſphere, draws to it thoſe that are already formed, and continues to form new ones till the whole collected maſs extends ſo far as to reach a part of the earth where there is a deficiency of the electric fluid. Thither, too, will thoſe clouds, replete with electricity, be ſtrongly attracted, and there will the electric matter diſcharge itſelf upon the earth: a channel of communication being in this manner formed, a freſh ſupply of electric matter will be raiſed from the overloaded part, and will continue to be conveyed by the medium of the clouds, till the equilibrium of the fluid between the two places of the earth be reſtored. When the clouds are attracted in their paſſage by thoſe parts of the earth, where there is a deficiency of the fluid, thoſe detached fragments are formed, and alſo thoſe uniform deſcending protuberances, which are, in ſome caſes, the cauſe of *Water-ſpouts* and *Hurricanes;* which ſee.

That the electric matter, which forms and animates the thunder-clouds, iſſues from places far below the ſurface of the earth, and that it buries itſelf there, is probable from the deep holes that have, in many places, been made by lightning; and from the flaſhes that have been ſeen to ariſe from ſubterraneous cavities and from wells; as well as from the inundations accompanying thunder-ſtorms, and occaſioned by water burſting out of the bowels of the earth. The greateſt difficulty attending this theory of the origin of thunder-ſtorms relates to the collection and inſulation of electric matter within the body of the earth. With reſpect to the former, this ingenious philoſopher has nothing to ſay: ſome operations in nature are certainly attended with a loſs of the equilibrium in the electric fluid, but no perſon has yet aſſigned a more probable cauſe of the redundancy of the electric matter, which, in fact, often abounds in the clouds, than what we may ſuppoſe poſſible to take place in the bowels of the earth: and ſuppoſing the loſs of the equilibrium poſſible, the ſame cauſe that produced the effect would prevent the reſtoring of it; ſo that not being able to force a way, at leaſt one ſufficiently ready, through the body of the earth, it would iſſue at the ſame convenient vent into the higher regions of the air, as the better paſſage. S. Beccaria obſerves, that a wind always blows from the place from which the thunder-cloud proceeds; and it is certain, that the ſudden congregation of ſuch a prodigious quantity of vapours muſt diſplace the air, and repel it on all ſides. A great number of obſervations relating to the deſcent of lightning, confirm his theory of the manner of its aſcent: for, in many caſes, it throws before it the parts of conducting bodies, and diſtributes them along the reſiſting medium, through which it muſt force its paſſage. Upon this principle, the longeſt flaſhes of lightning ſeem to be made, by its forcing into its way part of the vapours in the air. One of the principal reaſons why thoſe flaſhes make ſo long a rumbling, is their being occaſioned by the vaſt length of a vacuum, made by the paſſage of the electric matter. For although the air collapſes the moment after it has paſſed, and the vibration, on which the ſound depends, commences at the ſame moment; yet, if the flaſh was directed towards the perſon who hears the report, the vibrations excited at the nearer end of the track will reach his ear much ſooner than thoſe excited at the more remote end; and the ſound will, without any repercuſſion or echo, continue till all the vibrations have ſucceſſively reached him. Mr. Lullin, in order to account for the production of electricity in the clouds, made a long inſulated pole to project from one ſide of the Alps, and obſerved, that when ſmall clouds of vapour, raiſed by the heat of the ſun, roſe near the foot of the mountain, and aſcended along the ſide of it: if they touched the extremity of the pole only, it was electrified; but if the whole pole, and conſequently part of the hill on which it ſtood, was likewiſe involved, it was not electrified. Whence he concludes, that the electricity of the clouds is produced by their paſſing through the air while the ſun ſhines upon them. But to which of theſe two circumſtances, namely, the motion through the air or the action of the ſun's rays, this was owing, he could not determine, though he made ſeveral experiments for this purpoſe.

Upon the whole, it is eaſy to conceive, that when particular clouds or different parts of the earth poſſeſs oppoſite electricities, ſome being electrified poſitively, and others negatively, a diſcharge will take place within a certain diſtance; or the one will ſtrike into the other, and in the diſcharge a flaſh of lightning will be obſerved. But how the clouds or earth acquire this ſtate, is ſtill a queſtion not abſolutely determined. Mr. Canton queries, whether the clouds become poſſeſſed of electricity by the gradual heating and cooling of the air; and whether air ſuddenly rarefied, may not give electric fire to, and air ſuddenly condenſed receive electric fire from, clouds and vapours paſſing through it. Mr. Wilcke ſuppoſes the air to contract its electricity, in the ſame manner as ſulphur and other ſubſtances do, when they are heated and cooled in contact with various bodies. Thus the air, being heated or cooled in the neighbourhood of the earth, gives electricity to the earth, or takes it from it; and the electrified air, being conveyed upwards by various means, communicates its electricity to the clouds. Others have queried, whether, ſince thunder generally happens in a ſultry ſtate of the air, when it ſeems repleniſhed with ſome ſulphureous vapours, the electric matter then in the clouds may not be generated by the fermentation of ſulphureous vapours with mineral or acid vapours in the air.

Dr. Franklin adviſes perſons who are apprehenſive of danger from lightning, to ſit in the middle of a room, provided it be not under a metal luſtre ſuſpended by a chain, ſitting on one chair, and laying their feet on another. It is ſtill ſafer, he ſays, to bring two or three mattraſſes, or beds, into the middle of the room, and folding them double, to place the chairs upon them, for as they are not ſo good conductors as the wall, the lightning will not chooſe to paſs through them: but the ſafeſt place of all is in a hammock hung with ſilken cords, at an equal diſtance from all the ſides of a room. Dr. Prieſtley obſerves, that the place of moſt abſolute ſafety muſt be the cellar, and eſpecially the middle of it; for when a perſon is lower than the ſurface of the earth, the lightning muſt ſtrike it before it can poſſibly reach him. In the fields, the place of ſafety is within a few yards of a tree, but not quite near it. Nevertheleſs, S. Beccaria cautions perſons not to depend upon the neighbourhood of a higher, or, in all caſes, a better conductor than their own body; ſince, according to his repeated obſervations, the lightning by no means deſcends in one undivided track; but bodies of various kinds conduct their ſhare of it at the ſame time, in proportion to their quantity and conducting power. See on the ſubject of this article Franklin's Letters; Beccaria's Lettre dell' Elettriciſmo; Prieſtley's Hiſtory, &c. of Electricity, paſſim. Lord Mahon (now earl Stanhope) obſerves, that damage may be done by lightning, not only by the main ſtroke and lateral exploſion, but likewiſe by that which he calls the returning ſtroke, that is, by the ſudden violent return of that part of the natural ſhare of electricity (of any conducting body, or of any combination of conducting bodies) which had been gradually expelled from ſuch body or bodies reſpectively, by the ſuperinduced elaſtic electrical preſſure of a thunder cloud's electrical atmoſphere. See an account of his theory and experiments, relating to this ſubject, in his Principles of Electricity, &c. quarto, 1779.

The author of the Philoſophy of Agriculture remarks, that the blaſts occaſioned by lightning are more frequent, he believes, than is uſually ſuppoſed; as he is informed by thoſe who purchaſe extenſive woods, that very many trees, on being ſawed through, are found cracked and much injured by lightning. He had laſt year (1799) a ſtandard apple-tree and a tall apricot tree in full leaf, blaſted at the ſame time by lightning, as was believed. They both loſt all their leaves; the apple-tree, nevertheleſs, put out a new foliage and recovered, and bore fruit this year; but the apricot, which was nailed to a high wall, never ſhewed any returning life. Mr. Tull, he remarks, aſcribes one injury to the health of wheat plants, and frequently their death, to lightning, the effects whereof may be obſerved by the blackiſh parts or patches viſible in a field of wheat, eſpecially in thoſe years which have more thunder ſtorms than uſual, and adds, that againſt this there is no remedy. The erection of frequent metallic points could, as the doctor thinks, alone ſecure a garden or field from this misfortune; which probably occurs more frequently on damp ſituations than on dry ones.

He conceives, that the manner in which lightning deſtroys the life of vegetables may be ſimilar to that in which it deſtroys animal life; which is, he ſuppoſes, by its great ſtimulus, exhauſting the ſenſorial power in the violent action it occaſions, and thus producing total inirritability to the common ſtimuli, which ought to excite the vital actions of the ſyſtem. It may alſo affect vegetables in another way ſimilar to that, which probably alſo happens when their young ſucculent roots are frozen; that is, by burſting their veſſels, as it paſſes through them by its expanſive power; as happens to the large branches of ſome trees, and to ſtone buildings, and other bad conductors of electricity, when they are ſtruck with lightning. The expanſive power of electricity is not only ſhewn by trees and towers being rent by lightning, but by the ſound which ſucceeds the paſſage of it through air; ſince a vacuum, or nearly a vacuum, in reſpect to air, muſt previouſly be made by the preſence of the electric fluid: and the ſides of this vacuum ruſhing together, when the ſtream has paſſed, occaſions the conſequent vibrations of the air, which conſtitute ſound, whether in the audible ſpark of electricity, or the tremendous craſh of thunder. Some other effects on vegetables have been aſcribed by writers to lightning, but they have not yet been ſatisfactorily proved. See ELECTRICITY.

LIGHTNING, *Artificial.* The phoſphorus, when newly made, gives a ſort of artificial lightning viſible in the dark, which would ſurpriſe thoſe who are not uſed to ſuch a phenomenon: the uſual method of keeping this preparation is under water, and if the corruſcations are deſired to be ſeen to the greateſt advantage, the glaſs in which it is kept ſhould be deep and cylindric, and not more than three-fourths filled with water. The phoſphorus put into this water will ſend up corruſcations at times, which will pierce through the incumbent water, and expand themſelves with great brightneſs in the empty upper part of the bottle.

If we compare this artificial corruſcation to the real lightning, we ſhall find, that as in this the fire paſſes unaltered through the water, ſo in that the flaſhes of lightning, which come at intervals, paſs uninterrupted through the moſt denſe clouds, and are not obſtructed by the heavieſt ſtorms of rain, but like the beams of the ſun, or any other fire, paſs uninterrupted through glaſs and water. The ſeaſon of the weather, as well as the newneſs of the phoſphorus, muſt concur to produce theſe flaſhes; for they are as uncommon in winter as lightning is, but in warm weather both are very frequent.

The flame of lightning is generally inoffenſive, and does not, except upon particular circumſtances, ſet fire to any thing that it falls upon; and, in like manner, the flaſhings of the phoſphorus through the water will not burn the fleſh, nor even fire the moſt combuſtible things; though the phoſphorus itſelf, like the lightning, under proper circumſtances, may be a very conſuming and terrible fire. The warmth of the air, or the immediate beams of the ſun, will ſet fire to the condenſed body of the phoſphorus, and it then becomes this terrible fire; and in the ſame manner lightning, when condenſed and contracted, and wrapped up in a vehicle of air, ſo that it does not ſo eaſily diffuſe itſelf through the yielding ether, ſets fire to trees, houſes, or whatever it comes near.

The phoſphorus, while burning, acts the part of a coroſive, and when it goes out reſolves into a menſtruum, which diſſolves gold, iron, and other metals; and lightning, in the ſame manner, melts the ſame ſubſtances. From the whole, it appears that there is much more reſemblance between this phoſphorus and lightning than between gunpowder, or aurum fulminans, and that fire; though theſe have often been ſuppoſed to be nearly allied to its nature. See PHOSPHORUS.

LIGNAC, JOSEPH ADRIAN LE LARGE DE, in *Biography*, a learned French abbè, deſcended from a noble family, and born at Poictiers about the commencement of the laſt century. He was brought up among the Jeſuits, and in the courſe of time was choſen to fill different confidential poſts in that order, and in the Congregation of the Oratory. During a viſit which he had occaſion to pay to Rome, he was introduced to the pope Benedict XIV. and cardinal Paſſionei, who honoured him with attention and friendſhip. He died at Paris in 1762, leaving behind him a conſiderable reputation as a philoſopher, a naturaliſt, and theologian. He was author of "Elements of Metaphyſics deduced from Experience:" "The Poſſibility of Man's Corporeal Preſence in different Places at the ſame Time," in which he attempts to prove that the doctrine of tranſubſtantiation contains nothing in it incongruous with the principles of ſound philoſophy. "An Examination of the Treatiſe de l'Eſprit of Helvetius." As a naturaliſt, we have "Memoirs illuſtrative of Aquatic Spiders:" "A Letter to an American concerning the Natural Hiſtory of M. de Buffon:" and as a divine he publiſhed "The Teſtimony of internal Senſe and Experience, oppoſed to the profane and ridiculous Creed of modern Fataliſts," in three vols. At the time of his death he was employed in compoſing a treatiſe "On the Evidences of Religion."

LIGNE', in *Geography*, a town of France, in the department of the Lower Loire, and chief place of a canton, in the diſtrict of Ancenis; 9 miles N.W. of Ancenis. The place contains 1642, and the canton 5770 inhabitants, on a territory of 137½ kilometres, in 4 communes.

LIGNEA CASSIA. See CASSIA.

LIGNEVILLE, the MARCHESE DI, in *Biography*, an ingenious and learned dilettante at Florence in 1770, who had ſtudied counterpoint ſo ſeriouſly as to be able to ſet the hymn "Salve Regina" in canon for three voices. The compoſition is correct, and neatly engraved, copies of which were given to his friends. In the title of this production, dated 1770, the marquis de Ligneville is ſtyled prince of Conca, chamberlain to their Imperial majeſties, director of the muſic of the court in Tuſcany, and member of the Philharmonic ſociety of Bologna. He was ſon of the famous marſhal Ligneville, who was killed in the gardens of Colorno, a villa belonging to the duke of Parma, during the war of 1733, and was prince of Conca, in the kingdom of Naples, by right of his mother.

LIGNICENSIS TERRA, in the *Materia Medica*, the name of a fine yellow bole dug in many parts of Germany, particularly about Emeric, in the circle of Weſtphalia, and uſed in cordial and aſtringent compoſitions. It is a common ſuccedaneum for the yellow Sileſian bole, where that is not to be had, and is generally eſteemed very nearly, if not abſolutely, equal to it in its virtues.

It is moderately heavy, naturally of a ſmooth ſurface, and of a beautiful gold colour. It eaſily breaks between the fingers, and does not ſtain the ſkin in handling, melts freely in the mouth, and leaves no grittineſs between the teeth, and is immediately diffuſible in water. It makes no effervеſcence with acids; and burns to a fine red colour, and almoſt to a ſtony hardneſs.

Charlton (Foſſ. p. 5.) ſays it is more frequently known by the name of *terra ſigillata Goltbergenſis*.

There is another white bole known by this name. See GOLTBERGENSIS *terra*.

LIGNIE'RES, in *Geography*, a town of France, in the department of the Cher, and chief place of a canton, in the diſtrict of St. Amand; 24 miles S. of Bourges. N. lat. 46° 45'. E. long. 2° 15'. The place contains 1205, and the canton 6955 inhabitants, on a territory of 265 kilometres, in 11 communes.

LIGNITE. This name is given, by Brongniart, to the ſpecies of inflammable foſſils, called *braun kohle* (brown coal) by Werner. The following account, from Brongniart's Traité de Minéralogie, will ſupply the omiſſion of the article *Brown coal* in our work.

The combuſtible minerals belonging to this ſpecies are characteriſed by their ſmell and the products of their combuſtion. The odour which they emit in burning is pungent, often fetid, and has no analogy with that of coal or bitumens. They burn with a pretty clear flame, without bubbling and caking, like coal, and becoming fluid in the manner of the ſolid bitumens; they leave powdery aſhes ſimilar to thoſe of wood, but often more abundant, more ferruginous, and more earthy. The aſhes contain a ſmall portion of potaſh; at leaſt Mr. Majon has found about 3 in 100 in thoſe of the bituminous wood of Caſtelnuovo. Theſe combuſtibles yield an acid by diſtillation, which coal does not.

Lignites vary in colour from deep and ſhining black to a dull earthy-brown: the texture of moſt of the varieties indicates their origin and explains their name. The ligneous texture is often obſervable, though ſometimes it has wholly diſappeared. Its fracture is compact, often reſinous and conchoidal, or ſhining and even.

The external characters of the varieties of this ſpecies vary too much to allow them to be farther generaliſed.

1. *Jet Lignite; Jayet. Pech kohle*, Wern.

This ſubſtance is hard, ſolid, compact, and ſuſceptible of a bright poliſh; it is opaque and of a pure black colour; its fracture is undulated, and ſometimes ſhining like that of pitch. Specific gravity 1.259. It is ſaid to be ſometimes lighter than water; but Brongniart thinks this property rather belongs to the following variety.

Is found in ſtrata of little thickneſs, in marly, ſlaty, calcareous or gritty beds. It ſometimes exhibits the organical texture of wood.

It is found in France; in Provence, at Beleſtat in the Pyrenees; in the department of the Aude, near the village des Bains, ſix leagues to the ſouth of Carcaſſone (this ſometimes contains amber), and near Quilian, in the ſame department, in the communes of Sainte Colombe, Peyrat, and Baſtide; it is ſituated at the depth of ten or twelve yards, in oblique ſtrata between ſtrata of ſand-ſtone; but theſe ſtrata are neither pure nor continuous Jet proper to be worked is found in maſſes, the weight of which is ſeldom 55 pounds. Theſe mines have been wrought for a long time, and have produced a conſiderable quantity of jet, which was cut and poliſhed in the ſame country. It alſo occurs in Germany, near Wittemberg in Saxony, where it is alſo cut and poliſhed. Very fine jet has alſo been found in Spain, in Galicia, and the Aſturias. Is likewiſe ſaid to occur in Iceland, in the weſtern part of the iſland.

Beſides theſe, profeſſor Jameſon has quoted the following localities of pitch-coal or jet lignite; the coal diſtricts of the

Lothians, Fifeſhire, Linlithgowſhire, iſland of Skye, and Cannoby and Sanquhar, in Dumfriesſhire, in Scotland; Newcaſtle, Tindel fells, Bolton and Whitehaven, in England; Auſtria; Hungary, Bannat, Tranſylvania; Upper Luſatia; Sileſia; mount Meiſſner in Heſſia; Würtenberg; Franconia; Bavaria; Salzburg; Italy; Pruſſia.

Of this combuſtible ornaments are made, particularly mourning trinkets; it is poliſhed with water on a horizontal wheel of ſand-ſtone. Jet mixed with pyrites is generally rejected.

2. *Friable Lignite; Moor coal; Moor kohle,* Wern.

This variety occurs in thick and extenſive beds. It is of a lively black, but leſs ſhining than that of the preceding variety. Its great friability is particularly characteriſtic of it. Its ſurface is always cracked, and its maſſes divide with the greateſt facility into a number of cubic fragments; a character which is not found in jet.

Friable lignite is more abundant and conſequently more uſeful than the two firſt varieties. It is found in horizontal banks often thick and extenſive, but is never ſeen in ſuch large maſſes as coal, with which it has been confounded by ſome; it differs not only by its properties but alſo by its geognoſtic ſituation. It occurs in thoſe maſſes of ſand which often fill up vallies in calcareous mountains, or cover the ſides of the hills that ſkirt them. Is alſo found, though more rarely, in clayey marle.

Friable lignite is pretty common in the ſouth of France, ſuch as in the department of Vaucluſe. Alſo as conſiderable maſs at Luette, department des Forêts.

Other localities cited by authors are Leitmeritz, Saatz, and Ellenbogen in Bohemia: Thalern near Krems in Auſtria; Tranſylvania; Moravia; the iſland of Bornholm in the Baltic, and the Faroe iſlands. It occurs more frequently in Bohemia than in any other country. Jam.

It burns without difficulty, but ſpreads a very diſagreeable odour. It can be made uſe of only in manufactures, or to burn lime. Smiths cannot uſe it in their forges.

3. *Fibrous Lignite; Bituminous wood; Bituminöſes holtz,* Wern.

Its colour varies from a clear blackiſh-brown to clove brown; it has a perfectly woody form and texture; conſequently, its longitudinal fracture is fibrous, and its tranſverſal fracture ſhews the yearly layers of the wood. It is more eaſily frangible than wood, and takes a degree of poliſh when cut with a knife.

This lignite often occurs in large maſſes.

It is found in France; in the vicinity of Paris, near St. Germain, in the iſle of Chatou, which appears to be entirely formed of it; and near Vitry on the banks of the Seine, where is a thick bed of trunks of trees well preſerved. In the department of Arriège, the clefts of this lignite are filled with calcareous ſpar. In Liguria, near Caſtelnuovo, at the mouth of the Magra, it is found in thick and extenſive beds. In Heſſia, in the mountains of Ahlberg, the ſtratum is above two yards thick. At Steinberg, near Münden in Hanover, it forms two ſtrata, one of about ten yards, the other of ſix, ſeparated by a bed of rock from twelve to fourteen inches thick. In England, at Bovey near Exeter, there are ſeventeen pretty thick ſtrata, ſituated at a depth of about twenty-two yards under ſand and in potters' clay. In Iceland, where it is very abundant, it is called *Surturbrand;* the trunks which form theſe beds are very diſtinct, and appear merely to have been compreſſed.

To theſe localities we add the following from Jameſon: Scotland, in the fletz-trap formation, accompanied with pitch-coal, in the iſland of Skye; in ſeparate pieces in trapp-breccia in the iſland of Cannay; in fletz lime-ſtone, in the iſland of Skye, and in the independent coal formation in the county of Mid Lothian; Bohemia, in the Saatz and Leitmeritz circles; Auſtria; Tranſylvania; Moravia; Leoban in Stiria; Irſenberg in Bavaria; Upper Palatinate; Landeck in Sileſia; Halle; Merſeburg; Artern and Eiſleben in Thuringia; Kalten-Nordheim near Eiſenach; Wehrau, Upper Luſatia; Würtenberg; Freeienwalde and Königſwalde in Brandenburg; Welterwald; Salzburg; Ruſſia.

But this lignite is ſtill more common in ſmall detached maſſes; it ſometimes accompanies the preceding varieties; ſometimes it is found alone in ſmall layers, in the midſt of banks of clay or ſand. It is met with almoſt every where, and is uſed as fuel in thoſe places where it is abundant.

This combuſtible being ſcarcely decompoſed, and hence rather vegetable than mineral, would not deſerve to conſtitute a variety in a ſyſtem of mineralogy, if it did not paſs by imperceptible degrees into the preceding varieties, and into that which follows.

4. *Earthy Lignite; Earth coal; Erd kohle,* Wern.

Commonly called earth of Cologne, and ſometimes, though improperly, *umber;* but the true umber, which comes from Italy or the eaſt, contains nothing that is combuſtible, whence it cannot belong to this ſpecies.

This ſubſtance is black, or blackiſh-brown mixed with reddiſh. Its fracture and aſpect are earthy; it is fine-grained, eaſily frangible and even friable; it is rather ſoft to the feel. Its ſpecific gravity is nearly that of water. It burns, emitting a diſagreeable ſmell.

It not only often contains vegetable remains, but ſometimes itſelf preſents the texture of wood, without ever poſſeſſing either the colour and luſtre, or the hardneſs of the preceding varieties. It burns ſufficiently well to be uſed as fuel. It gives a gentle and equal heat.

It is found in ſecondary formation in the neighbourhood of coal mines, and more frequently in alluvial land.

As an authentic example of this variety may be mentioned the earthy lignite from the vicinity of Cologne, known in trade by the name of earth of Cologne. It is dug up at a little diſtance from that city, near the villages Brühl and Liblar, where it forms very extenſive beds of eight or ten yards in thickneſs, which are ſituated under elevated ground. It is immediately covered with a bed, more or leſs thick, of rolled pieces of quartz and jaſper, of the ſize of an egg, and reſts on a bed of white clay of an unknown thickneſs. The bed of lignite is homogeneous, but foſſil vegetables are found in it in a good ſtate of preſervation; they are, 1, trunks of trees lying one on the other without order; the wood is black or reddiſh, generally compreſſed, it readily exfoliates by drying in the open air. Some of theſe belong to dicotyledonous trees, others are fragments of palms. Among theſe M. Coquebert-Montbret has found ſome that are filled with a number of ſmall round pyritic bodies reſembling grains of ſmall ſhot. Similar ſmall, but elongated round grains, reſembling a two-celled pod, have been found by Mr. Heim, in the lignite of Kalten-Nordheim. This wood burns very well, and even with a ſmall flame. 2. Woody fruits, of the ſize of a nut, and which are conſidered as belonging to a ſpecies of areca. The lignite of Cologne contains about twenty *per cent.* of aſhes rather alkaline and ferruginous. Its uſes are manifold; it is worked in open air with a ſimple ſpade, but in order to convey it with greater convenience, it is moiſtened and moulded in veſſels which give it the ſhape of a truncated cone. It is generally uſed as fuel in the neighbourhood of Cologne. It burns ſlowly but readily and without flame, like fungus tinder, giving a ſtrong heat and leaving very fine aſhes. The latter being conſidered as a very good manure, a part of the lignite is burnt on the ſpot where it is wrought, for the ſake of obtaining them.

The earth of Cologne is particularly employed for painting in diſtemper and even in oil painting. The Dutch uſe it to adulterate ſnuff, and if it is not added in too great a quantity it gives the ſnuff a deſirable fineneſs and ſoftneſs, and cannot be in the leaſt injurious. Faujas.

This lignite is ſaid to occur alſo in Heſſia, Bohemia, Saxony, Iceland, &c.; but as there has been a confuſion between this ſubſtance and the variety of ochre called *umber*, we cannot be certain that theſe indications of localities are referable to earthy lignite.

It may have been obſerved, from what has been ſaid on the ſituations peculiar to ſome varieties of lignite, that this foſſil combuſtible belongs to depoſitions of the moſt recent formation, ſince it is found only in alluvial ſand or clay; it ſeldom or never occurs in ſtony depoſitions, except in coarſe grained lime-ſtone and under baſalt. In the mountains of Heſſia called the Ringe Kuhle, ſeveral thick beds of lignite are ſeen reſting on ſandſtone, and ſeparated by beds of potters' clay and ſand.—(Mohs). On the ſea-ſhore near Calais, fragments of lignite have been found that were penetrated by very tranſparent globularly aggregated quartz cryſtals.

The air which circulates where lignite is wrought is generally bad.

From what has been ſaid it appears (our author concludes) that lignite is of a very different formation from that of coal; indeed, Mr. Voigt thinks that there is no tranſition between theſe two ſubſtances.

The firſt of Brongniart's varieties of lignite, is by Werner given as a ſub-ſpecies of his ſchwartz kohle, or black coal.

A variety not mentioned in the above account of lignite, but nearly related to the fibrous lignite No. 3, is the ſub-ſpecies of Werner's brown-coal, called *common brown-coal.* Its colour is light browniſh-black, paſſing into blackiſh-brown. It occurs maſſive. Its fragments are indeterminately angular, more or leſs ſharp-edged. It is found at Bovey, and ſeveral other places mentioned under the localities of fibrous lignite or bituminous wood.

LIGNON, in *Geography*, a town of France, in the department of the Marne; 9 miles S. of Vitry le François.

LIGNUM ALOES, or *Wood of Aloes*. See ALOES.

LIGNUM *Balſami*. See BALSAM.

LIGNUM *Campechianum*. See LOG-WOOD.

LIGNUM *Caſſiæ*. See CASSIA.

LIGNUM *Colubrinum*. See STRYCHNUS. Garcias tells us of the wonderful effects of this drug againſt the bites of venomous ſerpents, and deſcribes two kinds of the plant which produces it; one having leaves like the pomegranate, and the other like the peach-tree: theſe, he ſays, both grow in the iſland of Ceylon; and Acoſta mentions two other ſpecies of plants producing this wood, both different from either of thoſe deſcribed by Garcias, and both growing in Malabar. We have alſo accounts in the Geographus Nubienſis of another lignum colubrinum, different from theſe, growing in Ethiopia, and poſſeſſed of the ſame virtues againſt the bites of ſerpents as the others. This laſt is called in the Arabic *haud alhaic*, the plain verbal tranſlation of which is ſnake-wood, or lignum colubrinum. He tells us, that it has ſome reſemblance in form to pyrethrum, and that the wood is always contorted.

Alha cararha is another of its Arabic names, and this is the word by which Avicenna, and the other Arabian writers, interpret the *pyrethrum* of Dioſcorides; but it is not certain whether the ſimilitude of ſounds between two or more Arabic words, may not have occaſioned ſome confuſion or error here. Dicæarchus, in his fragment of mount Pelion, deſcribes the root of a tree growing there, which is not only a ſovereign remedy for the bites of ſerpents, but even deſtroys them by its ſmell. This is alſo a lignum colubrinum; but whether the ſame with any of the others, or different from them all, we have not deſcriptions enough to determine.

It appears, upon the whole, that little can be depended on in the accounts of the medicine called lignum colubrinum by any author, unleſs he has himſelf experimented what he relates, and deſcribed the plant which produces the drug; for much imaginary virtue has been at all times given to many things againſt the bitings of ſerpents, and the lignum colubrinum of one author is not the lignum colubrinum of another.

LIGNUM *Nephriticum*. See NEPHRITIC.

LIGNUM *Vitæ*, the wood of a genus of trees, called by botaniſts *thuya*; which ſee.

Lignum vitæ is much valued by turners: making extremely beautiful cups, bowls, boxes, and other curioſities.

Lignum vitæ is alſo a name given to guaiacum.

LIGNY, in *Geography*, a town of France, in the department of the Meuſe, and chief place of a canton, in the diſtrict of Bar-ſur-Ornein. The place contains 2815, and the canton 10,081 inhabitants, on a territory of 192½ kiliometres, in 19 communes.

LIGNY-*le-Chateau*, a town of France, in the department of the Yonne, and chief-place of a canton, in the diſtrict of Auxerre; 9 miles N.E. of Auxerre. The place contains 1249, and the canton 7301 inhabitants, on a territory of 182½ kiliometres, in 15 communes.

LIGOR, a town of Aſia, and once capital of a kingdom, now ſubject to Siam, ſituated on a river of the ſame name. Here the Dutch have a factory for tin, rice, and pepper. N. lat. 8° 18′. E. long. 100° 35′.

LIGOR, or *Tantalam*, an iſland at the entrance of the gulf of Siam, triangular in its figure, and about 130 miles in circuit. N. lat. 8° 10′. E. long. 100° 50′.

LIGUA, a river of Chili, which runs into the Pacific ocean, S. lat. 32°.—Alſo, a town of Chili, on this river; 72 miles N.N.E. of Valparaiſo.

LIGUEIT, a town of France, in the department of the Indre and Loire, and chief place of a canton, in the diſtrict of Loches; 9 miles S.W. of Loches. The place contains 1998, and the canton 9756 inhabitants, on a territory of 327½ kiliometres, in 14 communes.

LIGUNY, a town of Samogitia; 44 miles E. of Miedniki.

LIGULA, a word uſed by medical writers in very different ſenſes. Some expreſs by it the clavicle, others the glottis; others uſe it as the name of a meaſure, for things either liquid or dry, being a quarter of a cyathus, equal to a forty-eighth part of a pint with us; others finally uſe it for a weight, leſs than half an ounce by two ſcruples, or ten ſcruples.

LIGULA, in *Natural Hiſtory*, a genus of the molluſca order of the claſs Vermes, according to the Linnæan ſyſtem: the character of this genus is body linear, equal, long; the fore part obtuſe, the hind part acute, with an impreſſed dorſal ſuture. There are only two ſpecies, *viz.* 1, the *inteſtinalis*, which has a clear white, and very narrow body, and which is found in the inteſtines of the merganſer and guillemot; about a foot long, and exactly reſembling a piece of tape. 2. The *abdominalis*, of which there are ſeveral varieties; the body is of a pale-aſh colour, and rather broad; it is found in the abdomen of the loche, gudgeon, tench, crucian, dace, bleak; cyprinus vimba, and bream. Theſe animals are found chiefly in the meſentery, emaciating the fiſh they infeſt, and making them grow deformed: when they eſcape from the body they penetrate through the ſkin; they are ſometimes ſolitary and ſometimes gregarious, about one-twentieth of an inch thick, and from ſix inches to five feet long.

LIGULATE Florets, in *Botany*, from *ligula*, a ſmall ſtrap, are ſuch as compoſe the radiant part of a daiſy. See Floret.

LIGURES, in *Ancient Geography*, a people of Gallia Ciſalpina, who occupied a territory along the ſea-coaſt, bounded on the N. by the Po, and ſeparated from Gaul by the Alps, and the oblique winding courſe of the Varus. Its eaſtern limit, at different periods, was the Macra, and the rapid Arnus. It comprehended the greater part of the diſtricts of Nice, Piedmont, Montferrat, Genoa, Modena, and Parma. This powerful nation was compoſed of many tribes, the boundaries of whoſe ſettlements cannot now be aſcertained with preciſion. Theſe tribes were the Vediantii, who inhabited a mountainous tract watered by the Varus, in which were Nicæa or Nice, and Cemenelium, or Cimia; the Intemelii, who occupied ſeveral places along the ſea-coaſt, *viz.* Intemelium, or Ventimiglia, Tropæa Auguſti, or Torbia, &c.; the Ingauni, whoſe capital was Albingaunum, or Albenga, and they alſo occupied the ſea-port towns of Vada Sabatia, or Vai, and Savo, now Savona; the Epanterii, who inhabited a mountainous diſtrict between the Vangienni and Ingauni; the Vangienni, who reſided near the declivity of Mons Veſulus, mount Viſo, and the ſources of the Po; the Statielli, who were cantoned at the bottom of the gulf of Genoa, in a hilly territory, that extended northward to the Tanarus; the cities and towns in this diſtrict, occupied by the Statielli, and other inferior tribes of the Ligures, were Genua or Genoa, Portus Delphinus, or Porto Fino, Segeſtra or Seſtri, Portus Veneris, or Porto Venere, and Luna; and the principal rivers of this diſtrict were the Macra and Boactes; the inland towns in the territory of the Statielli were Aquæ Statiellæ or Aqui, Ceba or Ceva, near the ſource of the Tanarus, Pollentia, Alba Pompeia, Aſta or Aſti, Bodincomagus or Induſtria on the Po, Forum Fulvii, ſurnamed Valentinum, on the Po, Cariſtum, Dertona or Tortona, and Iria or Voghiera. The Celelates and Cerdicates inhabited an inconſiderable diſtrict between the Trebia and the Po, now called Paveſan; their principal towns were Claſtidium, Chiaſtezo, and Litubium. The Briniates occupied a hilly tract not far from the ſea-coaſt, watered by the Boactes. The chief town of the Apuani was Apua, now Pontremoli, at the foot of the Apennines, near the ſource of the Macra. The Ananes, or Anamani were for ſome time eſtabliſhed in the territory now called Parma and Modena; the Lingones, in the northern part of Bologneſe, and in Ferrara; the Boii, in the S. part of the Bologneſe, at the foot of the Apennines; the Senones, in the eſtate of the church, along the coaſt of the Adriatic from Rimini to Ancona. To thoſe tribes belonged the following towns, *viz.* Parma, Brixellum or Berſello, Forum Novum or Fornovo, S.W. of Parma on the Tarus or Taro, Tanetum or Tanedo, between Parma and Modena, Calicaria, S. of the Po, Padinum or Buondena, N.W. of Forum Alieni, now Ferrara, Hadrianum or Ariano, Neronia above the mouth of the Po, and Spina at the mouth of the ſouth branch of the Po. The following towns were ſituated on Via Æmilia, between Parma and Arminium, *viz.* Tanetum already mentioned, Regium Lepidi or Reggio, Mutina or Modena, Bononia now Bologna, Claterna or Claterva, New Quaderno, Forum Cornelii or Imola, Faventia or Faenza, Forum Livii or Forli, Forum Popilii or Forlimpopoli. The inland ſettlements were Suſemontium, Aquinum, and Ravenna.

LIGURIA, a country of ancient Italy, which had on the W. a part of the Maritime Alps, and the river Varus; on the N. the Po; on the E. a part of Gallia Ciſpadana, and a ſmall portion of Etruria. In the time of Scylax, who wrote about the year 350 B.C., the Ligurians extended themſelves to the Arnus. See the preceding article.

LIGURIAN Republic. See Genoa.

LIGURINUS, in *Ornithology*, a name uſed by many authors for the bird more commonly known by the name of *ſpinus*, and called in England the *ſiſkin*.

LIGURIUS, in *Jewiſh Antiquity*, a precious ſtone on the high prieſt's breaſt-plate. It is called *leſchem* in Hebrew. Theophraſtus and Pliny deſcribe the ligurius to be a ſtone like a carbuncle, of a brightneſs ſparkling like fire.

The ligurius was the firſt ſtone in the third row upon the high prieſt's pectoral, and the name of God was inſcribed upon it. Ælian, De Animal. lib. iv. cap. 17. Pliny, lib. viii. cap. 38, and lib. xxxvii. cap. 3. Calm. Dict. Bibl. See Lyncurius *Lapis*.

LIGUSTICUM, in *Botany*, λιγυςικον of Dioſcorides, ſo called from Liguria, in Italy, its native country. The ancient plant evidently appears by the deſcription of this author to have been of the umbelliferous tribe, growing in mountainous ſituations, and of an aromatic pungent nature. So far it agrees with the Linnæan adaptation of the name; but among ſo intricate a tribe, who ſhall ſay that the *Liguſticum* of Linnæus is, or is not, the very ſame with that of Dioſcorides? Linn. Gen. 137. Schreb. 187. Willd. Sp. Pl. v. 1. 1424. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 309. Prodr. Fl. Græc. v. 1. 193. Ait. Hort. Kew. ed. 2. v. 2. 141. Juſſ. 222. Tourn. t. 171. Lamarck. Illuſtr. t. 198. Gærtn. t. 85. (Cicutaria; Tourn. t. 171. Danaa; Allion. Pedem. v. 2. 34. t. 63.)—Claſs and order, *Pentandria Digynia.* Nat. Ord. *Umbelliferæ.*

Gen. Ch. *General umbel* of numerous rays; *partial* ſimilar to it. *General involucrum* membranous, of about ſeven unequal leaves; *partial* of ſcarcely more than four, likewiſe membranous. *Perianth* of five teeth, ſcarcely diſcernible. *Cor. Univerſal* uniform; flowers all uſually fertile; partial of five equal, involute, flat, undivided petals, keeled inwardly. *Stam.* Filaments five, capillary, ſhorter than the corolla; anthers ſimple. *Piſt.* Germen inferior; ſtyles two, cloſe together; ſtigmas ſimple, obtuſe. *Peric.* Fruit oblong, angular, furrowed, ſeparable into two parts. *Seeds* two, oblong, ſmooth, marked with three elevated lines on the outer ſide, flat on the other.

Eſſ. Ch. Fruit oblong, with three ribs on each ſide. Flowers uniform. Petals involute, regular, undivided. Calyx of five teeth.

Obſ. Reichard obſerves that ſome male flowers are occaſionally intermixed. The fruit has not five grooves or furrows, but three elevated ribs, at each ſide.

1. L. *Leviſticum.* Common Lovage. Linn. Sp. Pl. 359. Woodv. Med. Bot. t. 190. Zorn. Ic. t. 233. Ehrh. Pl. Off. 393. (Leviſticum vulgare; Dod. Pempt. 311. Ger. em. 1008. Moriſ. Sect. 9. t. 3. f. 1.)—Leaves repeatedly compound; leaflets wedge-ſhaped at their baſe, unequally cut in the fore-part. Umbels many together. Native of the Ligurian Alps, whence it is taken for the λιγυςικον of Dioſcorides. In medico-botanical gardens it is preſerved on that account, but rarely elſewhere. The *root* is perennial, requiring a rich, rather moiſt ſoil. *Herb* five feet high, of a light, rather glaucous, green, ſmooth, ſtrongly aromatic

and acrid. *Leaves* bipinnate; leaflets about two or three inches long, and one broad, deeply cut. *Umbels* aggregate, ſtalked, their involucral leaves deflexed, whitiſh. *Flowers* ſmall, yellowiſh, coming out in May and June.

This plant, eſpecially the root, "whoſe flavour is leſs ungrateful (ſays Dr. Woodville) than the leaves," abounds with a yellowiſh fetid gum reſin. It was thought to be uſeful in removing obſtructions of various kinds, and even to aſſiſt delivery; but is now laid aſide.

2. L. *ſcoticum*. Scottiſh Lovage. Linn. Sp. Pl. 359. Engl. Bot. t. 1207. Fl. Dan. t. 207.—Leaves twice ternate, dilated, deeply ſerrated.—Native of ſea-ſhores in Sweden, Canada, Scotland; and recently diſcovered, as Mr. Winch informs us, at Dunſtonburgh caſtle, Northumberland. It is of much humbler growth than the firſt ſpecies, with twice ternate, broader and rounder *leaves*, ſhining beneath, rather ſerrated than cut. *Umbels* fewer, white with a reddiſh tinge. Mr. Lightfoot ſays this is eaten raw as a ſalad, or boiled as greens, in the iſle of Skye, where it is called *Siunas* or *Shunis*. The *root* is reckoned a good carminative, and an infuſion of the *leaves* in whey ſerves to purge calves.

3. L. *nodiflorum*. Nettle-leaved Lovage. Villars Dauph. v. 2. 608. t. 13. (Smyrnium nodiflorum; Allion. Pedem. v. 2. 21. t. 72. Angelica alpina, ad nodos florida; Tourn. Inſt. 313.)—Leaves twice or thrice ternate, dilated, taper-pointed, ſtrongly ſerrated. Umbels very numerous. Flower-ſtalks whorled, widely ſpreading.—Native of ſhady pine-foreſts on the Alps. *Stem* three or four feet high, ſolitary, with very numerous, whorled, divaricated, ſlender flower-ſtalks, and copious white *umbels*, whoſe involucral leaves are very few and narrow. Radical *leaf* ſolitary, large, ſmooth, twice or thrice ternate, or ſomewhat pinnate; the leaflets two or three inches long, ovate, taper-pointed, ſtrongly ſerrated in the manner of a nettle. Villars ſays the *root* is ſold at Lyons by the name of Bohemian Angelica, and has an aromatic flavour, leſs agreeable but more laſting than that of the true Angelica. It is diſtinct, as Villars well obſerves, from the *Angelica verticillaris* of Linnæus, and appears never to have come under his obſervation.

4. L. *peloponnenſe*. Hemlock-leaved Lovage. Linn. Syſt. Veg. ed. 14. 283. (L. peloponneſiacum; Linn. Sp. Pl. 360. Jacq. Auſtr. 33. append. t. 13. Seſeli peloponnenſe; Camer. Epit. 514. Matth. Valgr. v. 2. 112. Cicuta latifolia fœtidiſſima; Ger. em. 1062. Moriſ. Sect. 9. t. 6. f. 5.)—Leaves repeatedly pinnate; leaflets lanceolate, decurrent, taper-pointed, cut.—Native of mountainous woods in Carniola, Rhætia, Switzerland, and, as it ſhould ſeem, in the Peloponneſus; but Dr. Sibthorp did not find it. In gardens it is conſpicuous, but too much like hemlock to be cultivated for ornament. The *leaves* are very large, but finely cut, of a fine ſhining green, their ſegments numerous, crowded, remarkably decurrent and taper-pointed. *Umbels* white, one very large, with ſeveral ſmaller in whorls, accompanied by leaves, at the baſe of its ſtalk.

5. L. *auſtriacum*. Auſtrian Lovage. Jacq. Auſtr. t. 151. Allion. Pedem. v. 2. 15. t. 43. (L. n. 11; Gmel. Sib. v. 1. 196. t. 45.)—Leaves twice pinnate; leaflets wedge-ſhaped, decurrent, cut. Umbels leafy.—Native of the Alps of Auſtria, France, Italy, &c. Much like the laſt, but the *ſtem* is ſtouter; *umbels* larger and more leafy; *leaves* not ſo regularly pinnate or pinnatifid, nor ſo exactly decurrent, neither are they by far ſo taper-pointed.

6. L. *cornubienſe*. Corniſh Lovage. Linn. Sp. Pl. 359. Sm. Fl. Brit. 310. Ic. Pict. t. 11. Engl. Bot. t. 683. (L. aquilegifolium; Willd. n. 3. L. alterum belgarum; Lob. Ic. 786. Danaa aquilegifolia; Allion. Pedem. v. 2. 34. t. 63. Smyrnium luſitanicum minus, apii foliis; Tourn. Inſt. 316.)—Radical leaves twice compound, wedge-ſhaped, cut; ſtem-leaves ternate or ſimple, lanceolate and entire. Seeds ovate, tumid, obſcurely ribbed.—Native of buſhy ſtony places in Cornwall, Piedmont, and Portugal. Gathered by Dr. Sibthorp on mount Athos. It is perennial, and known from all the reſt by its principal compound *leaves* being all radical, the *ſtem* bearing only a few ternate or ſimple ones, quite undivided. The *umbels* are few and ſolitary. *Involucrum* ſcarcely membranous. *Seeds* remarkably tumid, ovate, black, obſcurely ribbed.—This plant, found in Cornwall in the time of Dillenius, who has figured it in his edition of Ray's *Synopſis*, t. 8, was long overlooked, and ſuppoſed to be loſt, till it was recovered about 25 years ago. Specimens ſent by Prof. Allioni to the writer of this have proved his *Danaa* to be the ſame. (See DANÆA.) Little did the late Prof. Sibthorp ſuſpect he had found ſo celebrated an Engliſh plant on mount Athos, which from his herbarium proves to be the caſe. Willdenow perhaps learnt from the Eſſay on Dorſiferous Ferns, Mem. de l'Acad. de Turin, v. 5. 420, that it was a *Liguſticum*, but having never ſeen it, either as the *Danaa* or the Corniſh Lovage, he has it twice in his Sp. Pl.

7. L. *pyrenæum*. Pyrenean Lovage. Willd. n. 8. Gouan. Illuſtr. 14, but not his t. 10. f. 2, which, though cited by himſelf, and copied by others, is *Thapſia garganica*. (L. alpinum perenne, ferulæ folio, floribus albis; Segu. Veron. v. 2. 41. t. 13.)—Leaves repeatedly compound; leaflets pinnatifid; ſegments nearly linear, awned. General involucrum ſlight. Seeds oblong, with membranous even ribs.—Native of the ſouth of France about the Pyrenées; alſo of mount Baldus, near Verona. The *leaves* are large, very finely divided, light green; their ſegments inclining to elliptical, decurrent, obtuſe, with a minute briſtle. *Stem* leafy. *Umbels* rather large; the general involucrum wanting, or deciduous; when preſent it is ſometimes of one three-cleft leaf. *Flowers* white, ſmall. *Fruit* elliptic-oblong, with ſtraight, pale, membranous ribs, and crowned with but a ſmall glandular floral receptacle. *Styles* reflexed.—Linnæus confounded this with his *Selinum Carvifolia*, but they appear to be ſufficiently different.

8. L. *multifidum*. Fine-leaved Lovage. (L. foliis triplicato-pinnatis, extremis lobulis breviter multifidis; Gmel. Sib. v. 1. 199. t. 46. Herb. Linn.)—Leaves thrice compound; ſegments linear, channelled, decurrent, pointed. Seeds ovate, with membranous, ſomewhat criſped, ribs.—Native of fields in the province of Iſet, in Siberia. Gmelin's ſpecimen is in the herbarium, but appears never to have been noticed in the works of Linnæus. The *root* is ſaid to have the taſte and ſhape of Carrot; it is as thick as the middle finger at the top, long and taper downward, yellowiſh without, white within. *Stem* two cubits or more in height, hollow, branched from about a third part of its height upward, the branches a foot long, ſomewhat leafy. Radical *leaves* with their long ſtalks about a ſpan long or more, finely thrice compounded, the ſegments uniformly narrow, acute, ſcarcely awned, channelled, entire, all decurrent, light green, ſmooth; ſtem-leaves much leſs divided, and ſmaller. *Umbels* not large, white; their general *involucrum* of about eight lanceolate, membranous-edged, leaves, and the partial ones are ſimilar. *Fruit* ſhort and roundiſh, with criſped wings, and a very large floral diſk or receptacle. *Styles* divaricated. *Stigmas* very obtuſe.

9. L. *candicans*. Pale Lovage. Ait. Hort. Kew. ed. 1. v. 1. 348. ed. 2. v. 2. 142.—Leaves repeatedly compound;

leaflets wedge-ſhaped, cut, ſmooth. General involucrum of two leaves, ſomewhat leafy. Ribs of the ſeeds membranous, ſmooth.—Introduced into Kew garden about the year 1780. It is ſaid to be a hardy perennial, flowering there in July and Auguſt; but its native country is unknown.

10. L. *peregrinum.* Parſley-leaved Lovage. Linn. Sp. Pl. 360. Jacq. Hort. Vind. v. 3. 13. t. 18.—Leaves repeatedly compound; leaflets three-cleft, wedge-ſhaped, cut. Seeds ovate, obtuſely ribbed. Umbels terminal.—Native of Portugal; gathered by the late M. Brouſſonet on the rock of Gibraltar, flowering in May. The *root* is biennal. The whole plant has the appearance, even the taſte and ſmell, of common parſley, but is in every part ſtouter and more rigid. There can be no doubt of its cloſe affinity to that plant; and great violence is offered to nature in referring one to *Liguſticum*, the other to *Apium*. Yet even the Bauhins diſtinguiſhed them as ſpecies.

11. L. *diffuſum.* Spreading Lovage. Roxburgh MSS. —Leaves twice compound; ſegments wedge-ſhaped, decurrent, three-toothed. Seeds ovate, ſtrongly ribbed. Umbels on lateral ſtalks, oppoſite to the leaves.—Native of the Eaſt Indies; given by Dr. Roxburgh, with the above name, to lord viſcount Valentia, to whom we are obliged for the ſpecimen. Its habit is ſo like the laſt, the *fruit* being of the ſame ſhape, though more ſtrongly ribbed, that it confirms the genus of that ſpecies. It differs in having ſmaller, leſs compounded, and blunter neatly toothed *leaves*, ſtrongly decurrent in their ſegments, and *umbels* on ſolitary, ſimple, lateral ſtalks. The *involucral* leaves are of a ſufficient number, lanceolate, long, narrow, pointed, with membranous edges. Ribs of the *ſeeds* prominent and ſomewhat criſped, not membranous.

12. L. *Meum.* Briſtle-leaved Lovage, Spignel, Meu, or Bald-money. Crantz. Auſtr. faſc. 3. 82. Roth. Germ. v. 1. 123. v. 2. 322. (Meum athamanticum; Jacq. Auſtr. v. 4. 2. t. 303. Sm. Fl. Brit. 308. Engl. Bot. t. 2249. Athamanta Meum; Linn. Sp. Pl. 353. Hudſ. 116. Œthuſa Meum; Linn. Syſt. Veg. ed. 14. 287. Willd. Sp. Pl. v. 1. 1447.)—Leaflets all in numerous, deep, briſtle-like ſegments.—Native of mountains in Italy, Spain, Germany, Switzerland and Britain, flowering in May. The propriety of referring it to this genus was hinted in Fl. Brit. and Crantz and Roth had previouſly ſo arranged it. Where ſo many different opinions have been ſtarted, the genus cannot be ſuppoſed very clear, but we venture to remove the plant hither. Its *root* is powerfully aromatic, with a flavour like melilot, of which the herb partakes; and an infuſion of the plant is ſaid to give cheeſe the taſte of the Swiſs *Chapziegar*. The finely divided *leaves* diſtinguiſh it readily. The *flowers* are white, with a bluſh occaſionally. *Fruit* oblong, often curved, coloured; its ribs ſtrong, not membranous, even, not criſped.

13. L. *balearicum.* Balearic Lovage. Linn. Mant. 218.—Radical leaves pinnate, rounded, ſerrated; the lower leaflets auricled: ſtem-leaves pinnate, narrow, cut. Fruit oblong.—Native of the Balearic iſlands, as well as of Italy and Spain. M. Brouſſonet gathered it at Gibraltar in May. Linnæus had this plant in the Upſal garden, but ſays it did not ripen ſeed, ſo that he was doubtful of the genus. It appears to us rather to belong to *Athamanta*. The young *fruit* is ſtriated rather than ribbed; the involucral leaves very ſlender, awl-ſhaped, not membranous. The *leaves* have ſomewhat of the aſpect of *Paſtinaca ſativa* in a wild ſtate. The *umbels* are wide, but ſlender, yellow.

14. L. *Gingidium.* New Zeeland Lovage. Forſt. Prod. 22. Willd. n. 12. (Gingidium montanum; Forſt. Gen. 21.)—Leaves pinnate; leaflets ovate, crenate; oblique and entire at the baſe.—Native of New Zeeland. Its aſpect is not unlike *Sium anguſtifolium*, but the *umbels* are axillary or terminal, and the *leaflets* very finely, rather ſharply, crenate, all broad and ovate.

15. L. *longifolium.* Long-leaved Lovage. Willd. n. 13. —"Leaves twice ternate; the radical ones doubly compounded; leaflets linear-lanceolate, entire."—Native of Siberia. Prof. Willdenow ſaw a dried ſpecimen. We know this ſpecies by his account only. He cites the *Peucedanum majus italicum* of Moriſon, ſect. 9. t. 15. f. 1, (at the bottom,) as ſeeming to agree with his plant.—The *leaflets* are ſtalked, linear, entire, tapering at each extremity, ſix or ſeven inches long, and three lines wide. General *involucrum* wanting; partial of many ſetaceous leaves.

We have, in the above view of the genus *Liguſticum*, added three ſpecies to his liſt, although we have reduced two of his into one.

LIGUSTICUM *Leviſticum*, or *Common Lovage*, in the *Materia Medica*. The odour of this plant is very ſtrong, and peculiarly ungrateful; its taſte is warm and aromatic. It abounds with a yellowiſh, gummy, reſinous juice, very much reſembling opoponax. Its virtues are ſuppoſed to be ſimilar to thoſe of angelica and maſter-wort in expelling flatulencies, exciting ſweat, and opening obſtructions; and it is therefore chiefly uſed in hyſterical diſorders and in uterine obſtructions. A teacup-ful of the juice with Rheniſh wine, or a decoction of the ſeeds with wine or mugwort water, was, by Foreſtus, ſaid to be a ſecret remedy of extraordinary efficacy in ſlow or laborious parturition. The leaves, eaten as ſalad, are accounted emmenagogue. The root, leſs ungrateful than the leaves, is ſaid to poſſeſs ſimilar virtues, and may be employed in powder. Woodv. Med. Bot.

LIGUSTICUM *Marmor*, in *Natural Hiſtory*, a name by which ſome authors have called the *Carrara marble*, the *marmor lunenſe* of the ancients. It is a fine white marble, harder than the Parian or ſtatuary kind, and uſed for tables, chimnies, &c. as the other for carving. See LUNENSE *Marmor*.

LIGUSTRUM, in *Botany*, a name found in Pliny and other Latin writers, by which the oriental Cypros (*Lawſonia inermis*) ſeems originally to have been intended, but which is now univerſally received for our Privet.—Linn. Gen. 9. Schreb. 12. Willd. Sp. Pl. v. 1. 41. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 12. Ait. Hort. Kew. ed. 2. v. 1. 19. Tournef. t. 367. Juſſ. 106. Lamarck Illuſtr. t. 7. Gærtn. t. 92.—Claſs and order, *Diandria Monogynia*. Nat. Ord. *Sepiariæ*, Linn. *Jaſmineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, very ſmall; mouth four-toothed, erect, obtuſe. *Cor.* of one petal, funnel-ſhaped; tube cylindrical, longer than the calyx; limb ſpreading, cut into four ovate ſegments. *Stam.* Filaments two, oppoſite, ſimple; anthers erect, almoſt as long as the corolla. *Piſt.* Germen ſuperior, roundiſh; ſtyle very ſhort, ſtigma cloven, obtuſe, thickiſh. *Peric.* Berry globoſe, ſmooth, ſingle-celled. *Seeds* four, convex on one ſide, angulated on the other.

Obſ. Gærtner more correctly deſcribes *Liguſtrum* as having a two-celled berry; the cells coated with a thin membrane, having two ſeeds in each cell.

Eſſ. Ch. Corolla four-cleft. Berry ſuperior, of two cells, with two ſeeds in each cell.

1. L. *vulgare.* Privet. Linn. Sp. Pl. 10. Engl. Bot. t. 764. Curt. Lond. faſc. 5. t. 1.—Leaves elliptic-lanceolate, obtuſe, with a little point.—Not uncommon in hedges and thickets where the ſoil is moiſt and gravelly, flowering in May and June, and ripening its berries in Auguſt.—This *ſhrub* riſes to the height of five or ſix feet. *Branches* wand-

like. *Leaves* oppoſite, nearly ſeſſile, dark green, ſmooth, lanceolate, (now and then elliptical,) entire, pointed, not acuminated, generally remaining through the winter. *Panicles* terminal, denſe. *Flowers* white, ſmelling diſagreeably. *Berries* dark purple, or blackiſh, very bitter, like the foliage and bark.

Privet is remarkable for thriving amidſt the ſmoky atmoſphere of towns, being frequently planted for hedges in gardens, for which purpoſe it is particularly eligible, ſince its foliage ſomewhat reſembles that of the myrtle, and in mild winters is almoſt evergreen. It was formerly known by the name of Print, or Prim-print, moſt probably from its neat and regular appearance when clipped and trimmed. The beſt mode of propagating this plant is by ſeed. It is eaten by the *Sphinx* Liguſtri, in its caterpillar ſtate, one of our fineſt native inſects. Curtis ſays that the berries are recommended in dyeing, colouring of wines, and as affording a purple colour to ſtain prints, though at the ſame time he remarks there are much better materials in common uſe for the ſame purpoſes.—This ſpecies is ſubject to variation with reſpect to its leaves, which are ſometimes variegated, and growing three at each joint. The berries have alſo been found white, or rather yellow. We ought not to omit mentioning that this fruit is one of the vegetable ſubſtances which has been ſuſpected to form a principal ingredient in the preſent popular gout medicine, the *eau medicinale d'Huſſon*.

2. L. *japonicum.* Broad-leaved Privet. Willd. n. 2. Thunb. Japon. 17. t. 1.—Leaves ovate, acuminate. Panicle divaricated.—A native of Japan, as its ſpecific name teſtifies; where it flowers in June and July, and ripens its fruit late in the autumn.—*Stem* eight or nine feet high, very much branched. *Branches* oppoſite, roundiſh, rugoſe, aſh-coloured, erect, rather ſpreading. *Leaves* oppoſite, on footſtalks, entire, with a deep furrow in their centre, green above, pale underneath, ſmooth, an inch broad, an inch and half long. *Footſtalks* round, furrowed on the upper ſide. *Flowers* in terminal ſpreading panicles. *Berry* ovate, ſmooth, the ſize of a pea.

3. L. *lucidum.* Chineſe Privet. Wax-tree. Ait. Hort. Kew. n. 2.—Leaves ovate-oblong, acuminate, ſhining above. Panicle greatly divaricated.—A native of China, and introduced into Kew garden by the Right Honourable ſir Joſeph Banks, K.B. in the year 1794. It flowers from July to September.—This *ſhrub* is only to be ſeen at the place above mentioned, where we are informed it makes a beautiful appearance, when covered with its copious white bloſſoms, in the open air. It is to be regretted that ſo deſirable a plant ſhould not be in general cultivation.

4. L. *ſinenſe.* Narrow-leaved Privet. Loureir. Cochinch. 19. Mart. Mill. Dict.—Leaves lanceolate, downy, panicles oblong, both lateral and terminal. Found near Canton in China.—This ſmall *tree*, according to Loureiro, grows to the height of about eight feet. *Branches* diffuſe, ſtraight. *Leaves* oppoſite, lanceolate, entire, downy, dark-green. *Flowers* white, ſmall, in oblong panicles. *Berry* very ſmall, roundiſh, of a brown colour.

LIGUSTRUM, in *Gardening*, comprehends a plant of the hardy deciduous and evergreen ſhrubby kind; of which the ſpecies cultivated is the common privet (L. vulgare). It is a ſhrub, uſually about ſix feet in height, branched, the bark of a greeniſh aſh-colour, irregularly ſprinkled with numerous prominent points; branches oppoſite, the young ones flexible and purpliſh; the leaves oppoſite, on very ſhort petioles, ſmooth on both ſides, perfectly entire, the lower ones at the bottoms of the ſmall branches leaſt: the panicle about two inches in length, cloſe and ſomewhat pyramidal; branches and pedicles appearing villoſe when magnified; the corolla white, but ſoon changing to a reddiſh-brown; the flowers are ſweet-ſcented; berry ſuperior, fleſhy, ſub-globular, ſhining, of ſo dark a purple as to ſeem black; it is found wild in moſt parts of Europe, &c. flowering in July, and the berries ripen in autumn.

Of theſe plants there are ſeveral varieties; as with the leaves in threes, and enlarged at the baſe; with ſilver-ſtriped leaves; with gold-ſtriped leaves, with white berries; and the evergreen or Italian privet, which riſes with a ſtronger ſtem, the branches leſs pliable, and grows more erect; the bark is of a lighter colour. The leaves much larger, ending in acute points, of a brighter green, and continue till they are thruſt off by the young leaves in the ſpring: the flowers are rather larger, and are not often ſucceeded by berries in this climate.

Method of Culture.—Theſe different plants are capable of being increaſed by ſeeds, layers, ſuckers, and cuttings; but the firſt method affords the beſt plants: the ſeeds ſhould be ſown in autumn, in a bed of common earth an inch deep, or in drills the ſame depth; but as they do not always grow freely the firſt year, they may be buried till next autumn, in pots of ſandy earth, in the ground, and then ſown as above: when the plants come up they ſhould be kept well weeded, and, when a year or two old, be planted out in nurſery rows, to remain two or three years, then removed where they are wanted to remain: the layers ſhould be laid down, from ſome of the pliable young branches, in the earth, in autumn or winter, when they will be rooted by the autumn following; then take them off from the ſtool, with their roots, and plant them in the nurſery for a year or two, or till of a proper ſize for the purpoſes they are intended: the ſuckers which ariſe annually from the roots ſhould be taken up in autumn, winter, or ſpring, with roots, and planted in the nurſery as above; the cuttings of the young ſhoots, eight or ten inches long, ſhould be planted in the autumn, in a ſhady border, where they will be properly rooted by the following autumn, when they may be planted out in nurſery rows, to acquire proper growth, in the manner directed above. The varieties with ſtriped leaves may be increaſed by budding, or inarching upon the plain ſort, or by laying down the branches; but they ſeldom ſhoot ſo faſt as to produce branches proper for this purpoſe; and being more tender, they ſhould have a dry ſoil and a warm ſituation: in a rich ſoil they ſoon loſe their variegation, and become plain. The Italian or evergreen ſort, which is now generally found in the nurſeries, is equally hardy with the other ſorts, and thrives in almoſt any ſituation: it is increaſed in the ſame manner; but as it ſeldom produces berries in this climate, they muſt be procured from the place of its native growth.

Theſe plants may be introduced in the ſhrubberies and other parts by way of variety, eſpecially the evergreen ſort.

But the chief uſe of the common ſort is to form ſuch hedges as are required in dividing gardens for ſhelter or ornament; yet the Italian or evergreen kind ſhould be preferred; it bears clipping well, is not liable to be diſfigured by inſects, and having only fibrous roots, it robs the ground leſs than almoſt any other ſhrub; it is one of the few plants that will thrive in the ſmoke of large towns, though it ſeldom produces any flowers in the cloſer parts after the firſt year: it alſo grows well under the drip of trees and in ſhade; the ſphinx liguſtri, or privet hawk moth, and phalena ſyringaria, feed on it in the caterpillar ſtate, and meloe veſicatorius, cantharides or bliſter beetle, is found on it. From the pulp of the berries a roſe-coloured pigment may be prepared; with which, by the addition of alum, wool and ſilk may be dyed of a good durable green: for which purpoſe they muſt be gathered as ſoon as they are ripe.

LIHONS, in *Geography*, a town of France, in the department of the Somme; 18 miles E. of Amiens. N. lat. 50° 15′. E. long. 2° 31′.

LIKA, a county and province of Dalmatia, or Auſtrian Croatia, bordering on the Adriatic, oppoſite to the iſland of Pago.

LIKAVA, a town and caſtle of Hungary; 5 miles N. of Roſenberg.

LIKE QUANTITIES, in *Algebra*, are thoſe which are expreſſed by the ſame letters, under the ſame power, or equally repeated in each quantity.

Thus $2b$ and $3b$, and $9ff$ and $3ff$, are like quantities; but $2b$ and $3bb$, and $9ff$ and $3fff$, are unlike ones, becauſe the quantities have not every where the ſame dimenſions, nor are the letters equally repeated.

LIKE *Signs*, or *Symbols*, are when both are affirmative, or both negative.

If one be affirmative, and the other negative, they are unlike ſigns.

Thus $+ 64d$ and $+ 5d$, have like ſigns; but $+ 9f$ and $- 7f$, have unlike ſigns.

LIKE *Figures*, in *Geometry*, are ſuch as have their angles equal, and the ſides about thoſe equal angles proportional. See SIMILAR.

LIKE *Arcs*, in the projection of the ſphere in plano, are parts of leſſer circles, containing an equal number of degrees with the correſponding arcs of greater ones.

LIKE *ſolid Figures*, are ſuch as are contained under like planes, equal in number.

LIKENAS, in *Geography*, a town of Sweden, in the province of Warmeland; 60 miles N.N.W. of Philipſtadt.

LI-KIANG-TOU, a city of China, of the firſt rank, in the province of Yun-nan, near the ſource of the river Yan-gong-kiang. This place is ſaid to be occupied by deſcendants of ſome ancient colonies of Chineſe; it has no other city under its juriſdiction, but the mountains that ſurround it ſeparate it from the land of the Lamas. Its mountains are ſaid to contain mines of gold. Amber and pine-apples are plentiful. The adjoining land is fertile, and is well watered. N. lat. 26° 52′. E. long. 100° 8′.

LILA, a town of Abyſſinia, on the coaſt of the Red ſea; 48 miles S.S.E. of Arkiko.

LILAC, in *Botany*, or rather *Lilâk*, the Turkiſh name for the Privet, *Liguſtrum vulgare*, according to Dr. Sibthorp; ſee Prodr. Fl. Græc. v. 1. 3. It is generally known in England as the appellation of the beautiful and popular *Syringa vulgaris*, which was introduced into our gardens, under the name of *Lilach*, or *Lillach*, in the time of queen Elizabeth; nor was this word by any means borrowed, as Dr. Johnſon ſuppoſes, from the *Lilas* of the French, though they have, doubtleſs, one common origin. The cloſe affinity and near reſemblance between the Privet and the Lilac, leave no room for wonder at their having the ſame name among the Turks. The common as well as the Perſian Lilac is cultivated by them, and the former at leaſt is found wild in ſome countries under their dominion. Matthiolus has given a fine cut of it (ſee *Lilac*, Matth. Valgr. v. 2. 575, 576.), from a drawing brought from Conſtantinople under this name; and it is curious to obſerve how the incorrect delineation of its fruit led him to miſtake it for a plant of the Piſtacia kind, and thence to ſuppoſe it a ſort of *Glans Unguentaria*, or *Ben* nut.

LILÆA, in *Ancient Geography*, a town which, according to Homer, was not far from the ſprings of the Cephiſſus, in the Phocide. When the Macedonians took poſſeſſion of it, Patron, one of the citizens, rouſed and armed the people, and cauſed them to evacuate it. In commemoration of this event, his fellow-citizens erected a ſtatue to his honour in the town of Delphi. In the time of Pauſanias it had a theatre, baths, and two temples, one in honour of Apollo, and another of Diana. The ſtatues were formed of Penthelic marble.

LILBURNE, JOHN, in *Biography*, famous for his exertions in the cauſe of liberty during the tyrannies of Charles I. and Cromwell, was born in the year 1618, of an ancient family, in the county of Durham. At an early age he was ſent, with very little education, to London, and put apprentice to Mr. Thomas Hewſon, of London-ſtone, a wholeſale clothier. He had, probably, imbibed thoſe principles for which he was afterwards diſtinguiſhed among his own relations in the country, and having a bold and intrepid mind, he was, from this period, involved in that perpetual ſeries of contention and ſuffering, of which we ſhall proceed to give a brief account. The firſt diſplay of his temper was exhibited in a complaint which he laid before the chamberlain of London, againſt his maſter for ill uſage. He carried his point, and obtained redreſs, and ever afterwards not only lived in peace with him, but he ſays, in his "Legal and Fundamental Liberties, &c." that he had in Mr. Hewſon "the trueſt friend that ever ſervant had of a maſter in the day of his trial." While he was in his apprenticeſhip he had much leiſure time, which he ſpent in reading the bible, the book of Martyrs, and the works of Luther, Calvin, Beza, &c. From theſe he unqueſtionably imbibed an enthuſiaſtic paſſion for encountering all dangers and ſufferings in the cauſe of truth. In 1636 he was introduced to the acquaintance of Dr. Baſtwick, at that time a priſoner in the Gate-houſe, whom he conſtantly viſited, and for whom he contracted ſuch a friendſhip and affection, that he could, he ſays, have readily laid down his life in his defence. He was ſoon engaged actively in the popular cauſe, and carried to Holland one of the doctor's anti-epiſcopal writings in order to get it printed. Shortly after his return he was apprehended, tried, and convicted in the ſtar-chamber court of printing and publiſhing libels and ſeditious books. At his examinations he refuſed to anſwer the interrogatories of his judges, and in every inſtance he juſtified and maintained the rights and privileges attached to his character as an Engliſhman. He was ſentenced on this occaſion to receive 500 laſhes, and then to be ſet in the pillory, which ſentence was executed with great ſeverity, the whipping being inflicted with knotted cords, as ordered by the bloody decree of old ſir Henry Vane. His ſpirit was not, however, ſubdued, for even on the pillory he uttered many invectives againſt the biſhops, and threw pamphlets from his pockets among the crowd. For this conduct he was remanded to priſon, and, according to his own account, endured a world of other unheard-of miſeries and barbarous cruelties for three years together. Though double-ironed, and in one of the worſt cells in the priſon, he contrived while there to get another libel printed and publiſhed. Such was the opinion held reſpecting his deſperate reſolution, that a fire having taken place near the cell in which he was locked up, he was ſuſpected of being the occaſion of it, for the ſake of obtaining his deliverance, and the other priſoners and neighbours joined in an application to have him removed, by which he obtained a more airy ſituation. On the meeting of the Long Parliament in 1640, he was allowed the liberties of the Fleet, an indulgence that enabled him to appear as a ringleader of an armed mob which aſſembled at Weſtminſter, and cried out for juſtice againſt the earl of Strafford, for which he was brought to the bar of the houſe of lords on a charge of treaſon, but diſmiſſed. In the following year the houſe of commons voted "That the ſentence of the ſtar-chamber againſt Mr. Lilburne was illegal, barbarous, bloody, and tyrannical, and that reparations ought to be given him for his impriſonment, ſufferings, and loſſes ſuſtained by that illegal ſentence." Neverthefeſs, he tells us, that he never received any remuneration, though he had been put to the expence of from 1000 to 1500*l.*, and had endured ſeven or eight impriſonments for nothing. When an army was raiſed by parliament, Lilburne entered into it as a volunteer, and, at the battle of Edge-hill, he acted as a captain of infantry. He behaved with diſtinguiſhed bravery at the battle of Brentford, where he was made priſoner, carried to Oxford, and arraigned on a charge of high-treaſon, but was ſaved by a declaration of parliament, threatening repriſals, and was ſoon after exchanged, was received with triumph by his party, and rewarded with 300*l.* as a compenſation for his ſufferings. Cromwell and Fairfax would willingly have employed him after they had new-modelled the army in 1645, and given him a high command; but his diſlike to the Preſbyterian church government would not permit him to ſerve the party then in power, and he laid down his ſword to reſume his pen, which he employed againſt Prynne, Lenthall, and other perſons. He was in conſequence committed to Newgate on a charge of ſeditious practices, but no bill being found againſt him, he was releaſed without trial. He next was brought before the houſe of lords for certain reflections caſt on the earl of Mancheſter, in a work entitled "The Juſt Man's Juſtification:" being examined upon interrogatories reſpecting the writing of that work, he not only refuſed to anſwer queſtions, but proteſted againſt their juriſdiction over him. He had ſtated the argument on this point, in full, in his "Legal and Fundamental Liberties of the People of England;" which he had maintained in the houſe, but which proved of no avail, as the houſe immediately made an order "that he be committed a cloſe priſoner in Newgate, and that none have acceſs to him but his keeper, until this court doth take farther order;" that is, ſaid Lilburne, "when they turn honeſt and juſt, which I confidently believe will never be." So much was he now regarded by the people as a champion of liberty, that a remonſtrance, ſigned by many thouſand names, was preſented to the houſe of commons in his behalf. This failing of effect, he continued to publiſh pamphlets, in which he diſplayed his grievances in ſuch bold and virulent language, that he rendered the leading men of all parties his enemies. It ſhould, however, be obſerved, that the leading men alluded to, were thoſe who were either adherents to the king, or thoſe who were attached to Cromwell; but Lilburne, perceiving that both parties were hoſtile to the liberties of the ſubject, did not ſcruple to oppoſe all their projects, which he ſuſpected, and juſtly too, would lead to the eſtabliſhment of a tyranny in ſome ſhape or other. He charged Cromwell with a deſign of uſurping the ſovereignty; and accuſed him and his relation Ireton of high treaſon, for which he was ordered to be tried as a libeller. At this period he had ſo many friends among the people, that the houſe of commons judged it proper to diſcharge him from priſon, and make an order for remunerating him for his ſufferings. At the time of the king's death, Lilburne was buſy in plans for ſettling a new model of government. Finding the leaders of the army reſolved to keep the power in their own hands, he oppoſed them with his uſual intrepidity, and maintained the right of the people to form a conſtitution for themſelves. So dangerous now did he appear to Cromwell and his council, that he was again committed to the Tower, and was brought to his trial for high treaſon before a ſpecial commiſſion. On this occaſion he defended himſelf with great firmneſs, never once ſhewing a diſpoſition to crouch to his proſecutors or his judges: he felt that he ſtood on firm ground, and was determined not to bend to the circumſtances of the times. The trial laſted many hours, and when the jury were about to retire to conſider their verdict, the foreman aſked permiſſion of the court to take a cup of ſack among them; to which the judge replied, it was impoſſible, they could have no manner of refreſhment while impannelled in a caſe of high treaſon. One of the court was willing they ſhould be indulged, but the chief juſtice ſaid he dare not permit it. Mr. Lilburne's jury retired for three quarters of an hour, and then brought in a verdict of Not Guilty: which, ſays the reporter of the trial, was received with unanimous plaudits from within and without, that continued without intermiſſion for more than half an hour. The judges, who ſeem to have ſtrained hard for a verdict of guilty, were abaſhed and confounded. Lilburne ſtood ſilent, affected and oppreſſed with the gratulations of his countrymen, unable to expreſs thoſe ſenſations which he unqueſtionably felt for the general intereſt which was taken in his cauſe. A medal was ſtruck of his head, with the following inſcription: "John Lilburne, ſaved by the power of the Lord and the integrity of his jury, who are judges of law as well as of fact." The names of the jurymen were given on the reverſe; names which muſt live ſo long as England is a free country. Mr. Hume, ſpeaking on this ſubject, and of thoſe who had uſurped the government, and of their unwillingneſs to truſt their cauſe to the deciſion of juries, choſen according to the ancient conſtitution of the country, ſays, "They had evidently ſeen in the trial of Lilburne what they could expect from juries. This man, the moſt turbulent, but the moſt upright and courageous of human kind, was tried for a tranſgreſſion of the new ſtatute of treaſons; but though he was plainly guilty, he was acquitted to the great joy of the people. Never did any eſtabliſhed power receive ſo ſtrong a declaration of its uſurpation and invalidity, and from no inſtitution, beſides the admirable one of juries, could be expected this magnanimous effort."

A new offence which he gave to parliament cauſed that body to paſs a ſentence of heavy fine and puniſhment againſt him, upon which he retired to Holland. Here he remained till the diſſolution of the Long Parliament, when he uſed all his intereſt to obtain a paſſport for his return to England, and not ſucceeding, he ventured, in June 1653, to come back without one. He was very ſoon apprehended and committed to Newgate, and being brought once more to trial, he defended himſelf on the plea of illegality in his ſentence of baniſhment, and was accordingly acquitted by his jury. The government, however, ordered him to be immediately ſent out of the kingdom, but giving ſecurity for his future quiet behaviour, he was ſuffered to remain. The nature of the ſecurity here referred to has excited ſome doubts in the hiſtorian; but the writer of the article in the Biographia Britannica, makes it appear highly probable, that Lilburne's brother Robert became ſecurity in this inſtance for his future peaceable demeanour. Having brought together the arguments in favour of this hypotheſis, the writer referred to ſays, "Laying then all theſe circumſtances together, can there be any reaſonable doubt who was the perſon that averted Cromwell's wrath againſt our author, and ſaved him from tranſportation, and after going through an uncommon variety of ſtorms, tempeſts, and ſhipwrecks, ſettling the weather-beaten veſſel in a peaceful and ſtill harbour; where, partly through a full conviction, that all poſſibility of ſucceſs in any farther ſtrugglings againſt his adverſary was cut off, and chiefly out of a religiouſly affectionate regard for his entirely beloved brother who ſtood reſponſible for him, he paſſed the remainder of his days in perfect tranquillity, equally undiſturbed by, and undiſturbing his triumphant competitor." John Lilburne now ſettled at Eltham, in Kent, joined the ſociety of quakers, and even preached at their meetings in Woolwich, and other adjacent places, till his death in 1657, at the early age of thirty-nine. He had a wife, who poſſeſſed the ſame undaunted ſpirit with that of her huſband, and was his faithful and affectionate helpmate in all his ſufferings. By Anthony Wood, Lilburne is ſtyled, "a great trouble-world in all the variety of government:" by other hiſtorians and biographers he has been repreſented to have been of ſo factious and quarrelſome a temper, that "if there were none living but him, John would be againſt Lilburne, and Lilburne againſt John." Such charges were brought againſt him by his contemporaries, and in his "Legal and Fundamental Liberties of the People of England," he has taken pains to rebut the calumnies of his adverſaries, and to ſhew that his hand was never lifted up but againſt tyranny and tyrants: and at the cloſe of that work he ſubſcribes himſelf "An honeſt and true bred free Engliſhman, that never in his life feared a tyrant, nor loved an oppreſſor." If it were Lilburne's misfortune to be a trouble to the exiſting governments under which he lived; it muſt be remembered that he vindicated the cauſe of his country in oppoſition to the arbitrary meaſures of Charles I. and the uſurpations of Oliver Cromwell; and however he might be regarded by his contemporaries, and miſrepreſented by party writers, poſterity muſt look to him with reſpect, and ſhould be thankful that ſuch a man exiſted, in times of peculiar difficulty, when the will of the few had well nigh ſuperſeded the authority of the law, and when every thing holy and excellent in our conſtitution muſt have been for ever loſt, but for the exertions of ſuch patriots as Lilburne. His efforts in the public cauſe were not more zealous than they were pure and diſintereſted. What he conceived to be juſtice and the public good, he purſued againſt all parties with an invincible ſpirit, and through a life of perſecution. He was, at the ſame time, a firm ſupporter of the laws of his country, which, in return, often ſupported him, and proved effectual barriers againſt arbitrary violence. Biog. Brit. Hume. Lilburne's Trial by Varax; and his Legal Fundamental Liberties of the People of England, revived, aſſerted, and vindicated.

LILEN, in *Geography*, a town of South America, in the province of Popayan; 15 miles S.W. of Cali.

LILESWARA, in *Hindoo Mythology*, a name of Siva, the regenerative power of the deity. (See SIVA.) It means Iſwara (or the lord) who gives delight, and was aſſumed with manhood, in one of the numerous metamorphoſes detailed in the Puranas, by this deity, who in this form became re-united to his ſpouſe Parvati, *giving delight* to her in her terreſtrial manifeſtation, under the name of Lileſwari. (See PARVATI.) The Puranas abound in this deſcription of incarnation of their male and female deities, which, thus veiled in allegory, are ſuppoſed to conceal hiſtorical and philoſophical facts. (See PURANA.) Mr. Wilford, in ſeveral of the volumes of the Aſiatic Reſearches, has purſued this allegorical maze with great induſtry. See more particularly vol. iii. vi. and viii. See alſo Hindu Pantheon, p. 389.

LILI, the name of one of the favourite remedies of Paracelſus, the baſis of which is antimony; but he has not given us the proceſs for preparing it.

LILIA, in *Botany*, a natural order of plants, ſo called from *Lilium*, the Lily, which is one of them. Tournefort, who underſtood this order in a wider ſenſe than more recent authors, denominated the plants which he referred to it, *liliacei*; Linnæus, and moſt others, call them *liliaceæ*.

The *lilia* conſtitute the fourteenth order in Juſſieu's ſyſtem, and the fourth of his third claſs. The eſſential characters of this claſs are "Cotyledon one. Stamens inſerted into the calyx or corolla." He gives its diſtinctions at length as follows.

"Calyx of one leaf, tubular or deeply divided, ſuperior or inferior, ſometimes naked, more generally attended by a ſheath containing one or many flowers, rarely by an involucrum reſembling an exterior calyx. Corolla none; for what is called corolla by Tournefort, Linnæus, and others, in the opinion of the writer (Juſſieu), is a real calyx. Stamens definite in number, rarely indefinite, inſerted either into the lower or the upper part of the calyx, oppoſite to its ſegments; the filaments ſeparate, rarely united; the anthers ſeparate, of two cells. In a few inſtances the germens are ſeveral and ſuperior; with as many ſtyles and ſtigmas, and the ſame number of ſingle-celled capſules, with one or many ſeeds, internally of two valves, which bear the ſeeds on their margins. In moſt caſes the germen is ſingle, ſuperior or inferior; ſtyle ſingle, rarely threefold, or wanting; ſtigma ſimple or divided; fruit pulpy or capſular, of three cells, with three ſeeds or many; ſometimes two of the cells are abortive, or there is only one of the ſeeds perfected. The ſeeds of the berries are affixed to the internal angle of each cell; in the capſules, uſually of three valves, they are inſerted here and there upon the edges of an elevated receptacle, conſtituting the partition, in the middle of each valve, and ſeparating along with it. The *corculum* is ſmall, in a large horny *albumen*."

The order of *lilia* is thus defined.

Calyx inferior, coloured, in ſix deep ſegments, uſually equal and regular. *Stamens* ſix, inſerted into the bottom of each ſegment. *Germen* ſimple, ſuperior; ſtyle one, rarely wanting; ſtigma in three diviſions. *Capſule* ſuperior, of three cells and three valves, with many ſeeds, which are ranged in a double row in each cell, and generally flat.

The *ſtem* is moſtly herbaceous. Radical *leaves* ſometimes ſheathing; the reſt ſeſſile, for the moſt part alternate, rarely whorled. *Flowers* either naked, or furniſhed with a ſheath, (*ſpatha*,) or accompanied by a leaf reſembling ſuch; often drooping, the ſtyle being longer than the ſtamens.

The genera are eight; *Tulipa*, *Erythronium*, *Glorioſa*, (for which laſt Juſſieu retains the name *Methonica*,) *Uvularia*, *Fritillaria*, *Imperialis* (the Crown Imperial, ſeparated from *Fritillaria*, becauſe its nectariferous cells are round inſtead of oblong), *Lilium*, and *Yucca*.

Linnæus calls his *lilia* the Patrician order, or Nobility of the vegetable kingdom, in his fanciful diſtribution of plants at the head of his *Syſtema Vegetabilium*. We may ſuppoſe that he had in view, in this inſtance, not only the analogies of the other orders, but eſpecially the text, ſo often quoted, "conſider the lilies of the field,—they toil not, neither do they ſpin," &c. in which theſe gorgeous plants ſeem more particularly indicated. The very ſpecies, which our Saviour had then perhaps before his eyes, is thought to have been the ſplendid *Amaryllis lutea*, with which the fields of Paleſtine are over-run at the end of autumn. Poſſibly this hint may be of uſe to biblical chronologiſts. The learned Olaus Celſius ſeems not to have adverted to this text, as alluding to any particular plant. Some have, without any reaſon, taken for granted that the Garden Tulip was meant; but that plant is not a native of Paleſtine.

The order of liliaceous plants is now receiving moſt magnificent illuſtration at Paris, in a work expreſsly deſtined to that purpoſe, by M. Redouté, of which five volumes in folio have reached us. The figures are printed in colours, in the modern French manner. The deſcriptions are in French. Many plants, not properly belonging to the ſame family, are admitted into this publication, as a few of the *Orchideæ*, and *Scitamineæ*, which, though they interfere with its oſtenſible deſignation, certainly do not leſſen its value, either as to beauty or utility.

LILIACEOUS Plants, in *Gardening*, all ſuch as reſemble thoſe of the lily kind, in their flowers having ſix regular petals, in the form of a lily; or three, or even one petal deeply divided into ſix ſegments, aſſuming a lily-flower form: they have not, however, all flowers ſo large as that of the lily, ſome being conſiderably ſmaller; and as the common lily has no calyx, ſo ſeveral of the liliaceous flowers are alſo deſtitute of a cup; and others have cups, which are principally of that ſort called a ſpathe. They may, therefore, be diſtinguiſhed into ſuch as have cups and ſuch as have not.

Thoſe with cups are all the different ſorts of the common lily: the tulip, all the kinds; fritillary, and crown imperial; hyacinth; ſtar of Bethlehem; baſtard ſtar of Bethlehem; tuberoſe; aſphodel; ſquill; hemerocallis, or daylily; anthericum, or ſpiderwort; aloe; yucca, or Adam's needle; glorioſa, or ſuperb lily, &c.

Thoſe with ſpathes or cups are the crocus; galanthus, or common ſnow-drop; leucoium, or great ſnow-drop; daffodil, narciſſus, and jonquil; crinum, or aſphodel lily; colchicum; iris, or flower-de-luce; hemanthus, or bloodflower; gladiolus, or ſword-lily; Virginia ſpider-wort; amaryllis, including the Guernſey lily, belladonna lily, and Jacobea lily, &c.; pancraticum lily, &c.

It may be noticed, that the greater part of theſe liliaceous plants of both kinds are bulbous-rooted: ſome, however, have tuberous, and ſome fibrous roots; and all of them are perennial in root, but annual in the ſtalk or ſtem.

Theſe are all ornamental garden-flowers, and moſt of them ſufficiently hardy to grow in the open ground; though a few are proper for the green-houſe and ſtove, as they require protection. See theſe different genera.

LILIAGO, in *Botany*. See Anthericum.

LILIASTRUM, the beautiful St. Bruno's lily. See Anthericum.

LILIENDAL, in *Geography*, a town of Sweden, in the province of Nyland; 15 miles N.E. of Borga. N. lat. 60° 23′. E. long. 26° 3′.

LILIENTHAL, a town of the duchy of Bremen, ſituated on the river Worp; 10 miles N.N.E. of Bremen.

LILIO-Asphodelus, in *Botany* See Crinum and Hemerocallis.

Lilio-*Fritillaria*. See Fritillaria.

Lilio-*Hyacinthus*. See Scilla.

Lilio-*Narciſſus*. See Amaryllis and Pancratium.

LILIUM appears to be a name of rather obſcure origin; ſome deduce it from the Greek λειριον, *a lily*, derived from λειος, *ſmooth, not rough*, alſo *handſome*, becauſe the plant is conſpicuous for the beauty of its flowers. It has moreover been called κρινον, from κριμνον, *duſt*, or *pollen*, becauſe the flowers ſeem in general to be ſprinkled with a powdery ſubſtance, from the abundance of their pollen. *Lilium* is adopted from Pliny and other Latin authors. Linn. Gen. 163. Schreb. 218. Willd. Sp. Pl. v. 2. 84. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 240. Tournef. t. 195. Juſſ. 49. Lamarck. Illuſtr. t. 246. Gærtn. t. 83.—Claſs and order, *Hexandria Monogynia.* Nat. Ord. *Coronariæ*, Linn. *Lilia*, Juſſ.

Gen. Ch. *Cal.* Perianth none. *Cor.* bell-ſhaped, narrower at the baſe; petals ſix, erect, lying over each other, obtuſely carinated at their backs, more expanding and broader upwards; their tips obtuſe, thick, reflexed. Nectary a longitudinal line, tubular, forming a channel in each petal from its baſe to the middle. *Stam.* Filaments ſix, awl-ſhaped, erect, ſhorter than the corolla; anthers oblong, incumbent. *Piſt.* Germen ſuperior, oblong, cylindrical, marked with ſix furrows; ſtyle cylindrical, the length of the corolla; ſtigma thickiſh, triangular. *Peric.* Capſule oblong, ſix-furrowed, hollow, triangular, and obtuſe at the top, of three cells and three valves; the valves connected by a network of fibres. *Seeds* numerous, incumbent in a double order, flat, outwardly ſemicircular.

Obſ. The nectary, in ſome ſpecies, is bearded, in others naked. In ſome the petals are totally revolute, in others not ſo.

Eſſ. Ch. Corolla of ſix petals, bell-ſhaped, each petal marked with a longitudinal nectary. Capſule with valves connected by a network of fibres.

Examples of this beautiful and fragrant genus are the following. The colour of their flowers is either white, yellow, or red. The fourteenth edition of Linnæus's *Syſtema Vegetabilium* compriſes ten ſpecies. Willdenow has ſixteen, though his firſt, *L. cordifolium*, belongs to another genus, which Mr. Saliſbury, in Tr. of Linn. Soc. v. 8. 11, has propoſed to call *Sauſſurea*. (See Hemerocallis.)

L. *candidum*. Common White Lily. Linn. Sp. Pl. 433. Sm. Prod. Fl. Græc. v. 1. 227. Curt. Mag. 278. Redouté Liliac. t. 199. Woodv. Med. Bot. t. 101. (L. album; Rudb. Elyſ. v. 2. 167.)—Leaves lanceolate, ſcattered, attenuated at the baſe. Corolla bell-ſhaped, ſmooth on the inſide.—This is the Κρινον of Dioſcorides, and Κρίνο of the modern Greeks. Great doubts exiſted reſpecting the native habitat of this well knowm and elegant plant, till Mr. Hawkins, the friend and companion of Dr. Sibthorp, found it growing wild in that truly claſſical and celebrated ſpot, the vale of Tempe. It flowers early in the ſummer, and has been cultivated in our gardens from time immemorial. *Root* a large ſcaly bulb, from which proceed many ſucculent fibres. *Stem* firm, upright, ſimple, uſually riſing to the height of about three feet. *Leaves* numerous, long, ſmooth, ſeſſile. *Flowers* large, white, in a cluſter at the top of the ſtem; the petals are of a beautiful ſhining white on their inſide, ridged, and not quite ſo tranſparent or luminous on their outſide.

Pliny and Ovid have each added their teſtimony to the general admiration in which this plant has been univerſally held. The former ſays, *Lilium Roſæ nobilitate proximum eſt.* The latter has thus poetically aſcribed its origin to the milk of Juno:

> " Dum puer Alcides Divæ vagus ubera ſuxit
> Junonis, dulci preſſa ſapore fuit;
> Ambroſiumque alto lac diſtillavit Olympo
> In terras fuſum Lilia pulchra dedit."

Both theſe flowers have furniſhed ancient and modern poets with their ſhare of metaphor; either ſingly

> " —— Vel mixta rubent ubi lilia multâ
> Alba roſâ; tales virgo dabat ore calores."
>
> Æn. l. xii. 68.

The flowers have a pleaſant ſweet ſmell, and were formerly uſed for medicinal purpoſes, particularly as an antiepileptic and anodyne. A water diſtilled from them was uſed as a coſmetic, and the "oleum liliorum" was ſuppoſed to poſſeſs anodyne and nervine powers: but the odorous matter of theſe flowers is very volatile, being totally diſſipated in drying, and wholly carried off in evaporation by rectified ſpirit as well as water; and though both menſtrua become impregnated with their agreeable odour by infuſion or diſtillation, yet no eſſential oil could be obtained from ſeveral pounds of the flowers. Hence the Edinburgh College now directs the uſe only of the roots, which are mucilaginous, and are chiefly employed, boiled with milk or water, in emollient and ſuppurating cataplaſms: it is not improbable, however, that the poultices formed of bread or farina, poſſeſs every beneficial quality aſcribed to thoſe of lily-root. Gerard recommends them internally in dropſies. For this purpoſe, bread was made of barley meal, with the juice of the roots, and conſtantly uſed for a month or ſix weeks; but Dr. Lewis obſerves, that there are inſtances of ſimilar cures by the uſe of common bread; and that probably, in one caſe as well as in the other, abſtinence from liquids was the remedy. Lewis Mat. Med. Woodv. Med. Bot.

L. *bulbiferum*. Bulb-bearing, or Orange Lily. Linn. Sp. Pl. 433. Jacq. Auſtr. t. 226.—Leaves linear-lanceolate, ſcattered. Corolla bell-ſhaped, erect, glandular and rough on the inſide, downy without.—A native of Italy, Auſtria, and North America. It flowers in June and July. *Bulb* compoſed of numerous thick, white, looſely imbricated ſcales. *Stem* upright, about a foot and half high, ſtriated and angular, ſmooth, or ſlightly hairy. *Upper leaves* ſpreading horizontally, having a roundiſh pale-green or purpliſh bulb at their baſe. *Flowers* large and handſome, of a beautiful red or orange colour, paler on the outſide, inodorous.

There are ſeveral varieties of this generally cultivated plant, of which the moſt common is that figured in Curt. Mag. t. 36, but the darker tinted one of Jacquin is handſomeſt, bearing more bulbs and fewer flowers.

L. *ſuperbum*. Superb Martagon Lily. Linn. Sp. Pl. 434. Curt. Mag. t. 936. Redouté Liliac. t. 103.—Lower leaves whorled, the reſt ſcattered. Flowers forming a branched pyramid, reflexed. Corolla revolute.—A native of North America, whence it was imported by Mr. Peter Collinſon in the year 1738. It flowers from June to Auguſt. Wild ſpecimens of this beautiful ſpecies are ſeldom found with above three or four flowers, but they may be brought, by careful cultivation, to bear from twelve to fifteen. *Bulb* white as ivory. *Stem* round, ſmooth and even, two or three feet in height, branched. *Flowers* large and handſome, one at the end of each branch, red or yellow with dark ſpots; their ſmell is diſagreeable.

One of the fineſt figures that can be exhibited of this or any other plant, may be ſeen in the ſecond number of Dr. Thornton's Illuſtration of the Linnæan Syſtem.

L. *philadelphicum*. Philadelphian Lily. Linn. Sp. Pl. 435. Curt. Mag. t. 519. Redouté Liliac. t. 104.—Leaves whorled. Flowers erect. Corolla bell-ſhaped; petals unguiculate.—Sent from Philadelphia by Mr. John Bartram in the year 1757. It flowers in July. *Bulbs* ſmall, white and ſcaly. *Stem* rather more than a foot high, bearing two elegant flowers at the ſummit. Petals red and yellow, ſpotted towards their baſe with darkiſh red or purple.

Among the moſt common ſpecies in the gardens are *L. chalcedonicum*, Curt. Mag. t. 30, which is the Scarlet Martagon, ſo remarkable for its fine colour; and *L. Martagon*, Curt. Mag. t. 893, the Purple Martagon, or Turk's Cap Lily; both are very hardy.—*L. tigrinum*, Curt. Mag. t. 1237, (*L. ſpecioſum*; Andr. Bot. Repoſ. t. 586.) is however perhaps the moſt ſhowy ſpecies of all. It was introduced from China, by ſir Joſeph Banks, in the year 1807, and is found to bear our climate if cultivated in a border of bog earth, flowering in Auguſt.

Lilium *Convallium*. See Convallaria.

Lilium, in *Gardening*, containing plants of the bulbous-rooted flowery perennial kind, of which the ſpecies uſually cultivated are the common white lily (L. candidum); the Cateſby's lily (L. Cateſbei); the bulb-bearing or orange lily (L. bulbiferum); the purple martagon lily, or Turk's cap (L. martagon); the pomponian lily (L. pomponium); the ſcarlet martagon lily (L. chalcedonicum); the great yellow martagon lily (L. ſuperbum); the Canada martagon lily (L. Canadenſe); the Kamtſchatka lily (L. Camſchatcenſe); and the Philadelphian martagon lily (L. Philadelphicum).

In the firſt ſort the principal varieties are, with ſtriped flowers, or with blotched purple flowers, or with variegated ſtriped leaves, or with yellow edged leaves, with double flowers, and with pendulous flowers. But the firſt of theſe varieties is now become common; the purple ſtain giving the flower a dull colour, the common white is generally preferred. The ſecond is chiefly valued for its appearance in winter and ſpring; for the leaves coming out early in the autumn, ſpreading themſelves flat on the ground, and being finely edged with a fine yellow band, make a pretty appearance during the winter and ſpring months, as it flowers earlier than the plain ſort. The third is of little value, as the flowers never open well unleſs they are covered with glaſſes; nor have they any of the rich odour of the common ſort. The fourth came originally from Conſtantinople; the ſtalk is much more ſlender; the leaves narrower, and fewer in number; the flowers not quite ſo large, and the petals more contracted at the baſe; they always hang downwards; the ſtalks are ſometimes very broad and flat, appearing as if two or three were joined together: when this happens, they ſuſtain from ſixty to one hundred flowers, and ſometimes more; this, however, is merely accidental, as the ſame root ſcarcely ever produces the ſame two years together, or in ſucceſſion.

The third ſort has varieties with double flowers, with variegated leaves, with ſmaller ſtems, and the bulb-bearing fiery lily, which ſeldom riſes more than half the height of the others; the leaves are narrower; the flowers ſmaller, and of a brighter flame-colour, few in number, and more erect: they come out a month before thoſe of the common ſort, and the ſtalks put out bulbs at moſt of the axils, which, if taken off when the ſtalks decay, and planted out, they readily produce new plants.

In reſpect to the ſub-varieties, they are the great broad-leafed, the many-flowered, the ſmall, and the hoary bulb-bearing lily.

The fourth kind varies with white flowers, with double flowers, with red flowers and hairy ſtalks, and with imperial divided ſtalks.

The fifth ſpecies has varieties with double red flowers, with white flowers, with double white flowers, with red ſpotted flowers, with white ſpotted flowers, with yellow ſpotted flowers, with early ſcarlet flowers, and the major ſcarlet pompony.

And the ſixth ſort, according to Mr. Curtis, varies in the number of flowers, from one to ſix, and the colour in ſome is of a blood-red; alſo, with deep ſcarlet flowers, with purple flowers, and with large bunches of flowers.

ſtolen goods, but the evidence being inſufficient to convict him he was acquitted. In 1659, he received a handſome gold chain and medal from the king of Sweden, on account of his having mentioned that monarch in his almanac for two ſucceſſive years with applauſe. On the reſtoration of Charles II. he was examined as to the perſon who decapitated the late king, and declared that it was cornet Joyce. On account of the part which it was known he had taken during the commonwealth, he was glad to ſue out a pardon under the great ſeal, which was granted him. In 1665, when the plague raged in London, he removed to Herſham. After the great fire of London in 1666, he was examined as to the perpetrators of the deed, but he was unable by his art to ſatisfy his employers. Shortly after this he adopted for a ſon a perſon named Henry Coley, a taylor by trade, and gave him the profits of his almanac. Lilly died at Herſham in 1681, when he was about ſeventy-nine years of age. His works were numerous, the titles of which are given in the Biog. Brit., and alſo in Hutton's Mathematical Dictionary: the chief of them are "Chriſtian Aſtrology;" "A Collection of Nativities;" "Obſervations on the Life and Death of Charles late King of England;" and "Annus Tenebroſus, or the Black Year."

LILLY *of Paracelſus*. See TINCTURE *of Metals*.

LILLY *Point*, in *Geography*, a place of America, in King William County, Virginia, in which is a poſt-office; 134 miles from Waſhington.

LILOAN, a town on the E. coaſt of the iſland of Sibu; N. lat. 10° 40′. E. long. 123° 45′.

LILY, WILLIAM, in *Biography*, a famous ſchoolmaſter and grammarian, was born at Odiham, in Hampſhire, about the year 1466. He was educated at Magdalen college, Oxford, where he took a degree, and then went on a pilgrimage to the Holy Land. On his return he purſued his ſtudies at Rhodes, which iſland, after the capture of Conſtantinople, was the reſidence of ſeveral learned men, under the protection of the knights, its poſſeſſors. Here he ſtudied, and made great progreſs in, the Greek language; but for farther improvement in it, and in the Latin tongue, he viſited Rome, and attended the lectures of the moſt celebrated profeſſors. He now returned to London, and opened a ſchool for the learned languages, rhetoric and poetry, which he taught on pure claſſical principles. In 1510, when dean Collet founded St. Paul's ſchool, he appointed Lily the firſt maſter, a ſtation which he occupied with ſingular utility for twelve years. He died of the plague in 1522, or 1523. Lily was much eſteemed by his contemporaries, as well for his moral character, as for his literary abilities. He was the author of ſeveral Latin poems and tracts, but is beſt known for the grammar that goes under his name, and is ſtill uſed in our public ſchools. This was not wholly of his own compoſition, having been aſſiſted in it by the labours of cardinal Wolſey and dean Collet. Biog. Brit.

LILY, GEORGE, eldeſt ſon of the preceding, was born in London, and educated at Magdalen college, Oxford, after which he was made canon of St. Paul's and prebendary of Canterbury. He was the firſt perſon who publiſhed an exact map of Britain: he died in 1559, and left behind ſeveral works of merit, as "Anglorum Regum Chronices Epitome;" "Regum Angliæ Genealogia;" "Catalogus ſive Series Pontificum et Cæſarum Romanorum," &c. He left likewiſe a MS. life of biſhop Fiſher, which is depoſited in the library of the Royal Society. Biog. Brit.

LILY, in *Botany*. See LILIUM.

LILY, in *Gardening*, the common name of this well known flower plant. See AMARYLLIS, and LILIUM.

LILY *Aſphodel*, in *Botany*. See CRINUM.

LILY, *belladonna*, *daffodil*, *Guernſey*, *Mexican*, and *Japan*, names uſed by different authors for the amaryllis, or lilionarciſſus of Linnæus and Tournefort.

LILY, *Daffodil*. See AMARYLLIS and PANCRATIUM.

LILY, *Day*, or *St. Bruno's lily*. See HEMEROCALLIS.

LILY, *Hyacinth*. See SCILLA.

LILY, *May*. See CONVALLARIA.

LILY, *Perſian*. See FRITILLARIA.

LILY, *Superb*. See GLORIOSA.

LILY-*thorn*. See CATESBÆA.

LILY *of the Valley*. See CONVALLARIA.

LILY, *Water*. See NYMPHÆA.

LILY, *Leſſer yellow water*. See MENYANTHES.

LILYBÆUM, now *Marſala*, in *Ancient Geography*, a town of Sicily, S. of Drepanum, and near the promontory of the ſame name, now called Cape Bocco. It was the principal fortreſs of the Carthaginians in Sicily, and the only city that reſiſted Pyrrhus when he paſſed into this iſland in the 475th year of Rome; but having been ineffectually beſieged for five years, it was ceded to the Romans after the victory of Lutatius, A. U. C. 511. The iſle Ægades, the modern Maretimo, which is oppoſite to Marſala, ſeems to be the key of that immenſe harbour. It is formed by rocks, little low iſlands, tongues of land, and ſand-banks, which break the waves on all ſides, and form a large ſemi-circle, within which the ſea is always calm. It was from this fort that the formidable fleet commanded by Scipio Africanus ſailed, when he ſet out for Africa in the ſecond Punic war, A.U.C. 548. The beauty of this harbour induced the Saracens to call it "Marſala," ſignifying, in their language, the "Port of God." The number of inhabitants at Marſala is eſtimated at 25,000. Of this famous port and impregnable city, the traces that remain are ſome few ruins of the ancient walls W. of the town, built with enormous maſſes of ſtone, which no machine, before the invention of cannon, could ſhake. In front of theſe walls were deep ditches, hewn out of the rock, ſome parts of which ſtill exiſt. Here is no longer any anchorage for ſhipping, and the port is only fit for the reception of ſmall barks. It was deſtroyed, as it is ſaid, by Don John of Auſtria, who being unable to defend it, would not leave it open to the Africans, who were only at the diſtance of 50 leagues. At preſent Marſala has only a ſmall road, to which veſſels reſort in order to load with tunny, and the aſhes of kali, which are made here in great abundance, and form the principal and almoſt ſole object of the commerce of the country. The merchants of Marſeilles come hither to purchaſe it for their ſoap manufactories.

LIMA, in *Geography*, an audience of Peru, erected in the year 1542, which contains within its juriſdiction one archbiſhopric and four biſhoprics; *viz.* thoſe of Truxillo, Guamanga, Cuzco, and Arequipa. The archbiſhopric of Lima comprehends 15 juriſdictions, *viz.* the circuit of Lima, Chancay, Santa, Canta, Canete, Ica, Piſco, and Naſca, which three places form one juriſdiction, Guarachia, Guanuco, Yauyos, Caxatambo, Sarma, Jouxa, Conchucos, Guyalas, and Guamalies. The dioceſe of Truxillo contains ſeven juriſdictions; that of Guamanga nine; that of Cuzco fourteen; and that of Arequipa ſix.

LIMA, a famous city of the audience of Lima, and capital of the vice-royalty of Peru. This city, called "Civdad de los Reyes," or the city of the kings, from its having been founded by Don Franciſco Pizarro, on the feaſt of the Epiphany, A. D. 1535, is ſituated in the ſpacious and delightful valley of Rimac, whence, by corruption, the name Lima is derived: Rimac being the appellation of an idol to which the native Indians uſed to offer ſacrifices, as the

Yncas alſo did, after they had extended their empire hither: and as it was ſuppoſed to return an anſwer to the prayers addreſſed to it, they called it, by way of diſtinction, Rimac, or he who ſpeaks. The ſituation of this city is peculiarly advantageous, as it is placed in the centre of a valley, the whole of which it commands. Towards the north, at a conſiderable diſtance, is the Cordillera, or chain of the Andes; whence ſome hills project into the valley, the neareſt of which, to the city, are thoſe of St. Chriſtopher, and Amancaes. A river of the ſame name waſhes the walls of Lima, over which is an elegant and ſpacious ſtone bridge, with a gate of beautiful architecture, that forms the entrance into the city, and leads to the grand ſquare, which is large, and finely ornamented. In the middle of it is a noble fountain of bronze, and ſuch objects, uſeful as well as ornamental, are not uncommon. The form of the city is triangular, the baſe, or longeſt ſide, extending along the banks of the river. Its length is 1920 toiſes, or ⅔ds of a league; and its greateſt breadth from N. to S., that is, from the bridge to the angle oppoſite to the baſe, is 1080 toiſes, or ⅖ths of a league. It is ſurrounded with a brick wall, flanked with 34 baſtions; and in its whole circumference it has ſeven gates and three poſterns. On the ſide of the river oppoſite to the city is a ſuburb, called St. Lazaro, which has lately increaſed; all its ſtreets, like thoſe of the city, are broad, parallel, and at right angles, forming ſquares of houſes; all well-paved, ſupplied from the river with ſtreams of water, arched over, ſo that they contribute to cleanlineſs and ſalubrity, without the leaſt inconveniency. The number of ſtreets is ſaid to be 355, and of houſes 3941. Towards the E. and W. parts of the city, within the walls, are many fruit and kitchen-gardens; and moſt of the principal houſes have gardens for amuſement, which are continually refreſhed with water by means of canals. The whole city is divided into five pariſhes, and abounds with churches, convents, nunneries, colleges, and charitable foundations, which it would be tedious to recount, and it has alſo a famous univerſity, founded in 1576. All the churches and chapels are large, and adorned with paintings and other decorations of great value. The viceroys of Peru uſually reſide at Lima, enjoying all the privileges of royalty, and, beſides aſſiſting at the courts of juſtice, and the councils relating both to the finances and war, give every day public audience to all ſorts of perſons; for which purpoſe, there are in the palace three very grand and ſpacious rooms. Under the viceroy there is a number of officers, and of tribunals for the tranſactions of the buſineſs of the city and audience. The Cabildo, or Ayuntamiento, that is, the municipal body of the city, enjoys particular privileges; and the revenue of the capital exceeds 36,000 dollars. Since 1786, there is alſo a judge of the police, aſſiſted by an able architect, and other officers.

Upon the whole, we may obſerve, without reciting particulars, that Lima is not only large, magnificent, and diſtinguiſhed as the capital of the kingdom, by the reſidence of the viceroy, and the ſuperior courts and offices, but that it has an acknowledged ſuperiority over the other cities in that part of the world, from the inſtitutions that are eſtabliſhed for the advancement of literature and the ſciences. It is a place where luxury prevails to a great degree; the malls are crowded with handſome carriages; the number of coaches and calaſhes being computed at 1400. Nevertheleſs, amuſements are rare, and literature is neglected. Little encouragement is given to publications of a kind moſt likely to intereſt the inhabitants of the city and its environs. The univerſity of St. Mark is conducted on the plan of the Spaniſh univerſities. The theatre is a neat building; but the exhibitions do not diſplay much taſte. Coffee-houſes only began to be opened in 1771. Cock-fighting is a favourite amuſement on Sundays and feſtivals; nor are bull-fights unknown.

The number of inhabitants in this city, according to the lateſt enumeration, amounts to 52,627; the monks and clergy being 1392; the nuns 1585; the Spaniards, in general, 17,215; with 3219 Indians, and 8960 negroes, the reſt being Meſtizos, and perſons of other caſts. The rich eccleſiaſtics, proprietors of entailed eſtates, military and civil officers, and phyſicians, advocates, attornies, and artizans, may amount to 19,000; the reſt being ſlaves or domeſtics. The want of occupation leads many of the females to vice; and the men are rather inclined to indolence and ſloth. The population has declined ſince the erection of the new vice-royalty of La Plata; and it is likely ſtill farther to decreaſe, notwithſtanding an influx of 1400 perſons of all ſexes and conditions, who annually arrive as a ſupply; not to mention the Spaniſh girls, who, from the province of Piura in the north, and Ica in the ſouth, come hither to diſpoſe of their charms either in marriage or love, thoſe provinces being celebrated for female beauty. All the inhabitants of Lima, from the higheſt to the loweſt, are fond of fine clothes, and they indulge their paſſion to great exceſs. The women's dreſs conſiſts of a pair of ſhoes, a chemiſe, a petticoat of dimity, an open petticoat, and a jacket, which, in ſummer, is of linen, and in winter of ſtuff, to which ſome add a mantelette. Women of the loweſt condition, whoſe whole ſtock of apparel conſiſts merely of two chemiſes and a petticoat, wear bracelets, roſaries, and ſmall gold images, about their necks and arms, to the value of fifty or ſixty crowns. The females are, in general, of a middling ſtature, handſome, genteel, of a very fair complexion, with beautiful hair, and enchanting luſtre, and dignity in their eyes. They are naturally gay, ſprightly, jocoſe, without levity, and remarkably fond of muſic. The temperature of the air at Lima is agreeable; and though the difference of the four ſeaſons is perceptible, they are all moderate, and none of them troubleſome. Spring begins towards the cloſe of the year, *i. e.* towards the end of November, or beginning of December; this is ſucceeded by ſummer, the heat of which is moderated by the ſouth winds: at the latter end of June, or beginning of July, the winter begins, and continues till November or December, the autumn intervening. As rain is ſeldom or never ſeen at Lima, the place is equally free from tempeſts, and the inhabitants are totally ſtrangers to thunder and lightning: there are, however, other inconveniences and evils to which they are obnoxious. In ſummer they are tormented with fleas, bugs, and moſquitoes; but the moſt dreadful calamity to which this country is ſubject is the recurrence of earthquakes, of which they have had ſeveral, which have almoſt ruined the city. Theſe have occurred in 1582, 1586, 1609, 1630, 1655, 1678, 1687, 1690, 1697, 1699, 1716, 1725, 1732, 1734, 1745, and 1746; the latter being the moſt tremendous and deſtructive. As the beſt ſecurity againſt earthquakes, they build their houſes moſtly of wood, and the walls of wattled oziers or canes, covered with clay, and painted. The diſtempers moſt common at Lima are malignant, intermittent, and catarrhous fevers, pleuriſies, and conſtipations; and theſe rage continually in the city. The ſmall-pox is alſo known here; and when it occurs proves fatal to many. The wealth of this city is chiefly derived from the mines in the provinces to the north and ſouth; but agriculture proſpers very much in the vicinity, and the fields ſupply food for a multitude of horſes and cattle. The fertility of the ſoil was very much improved in ancient times by the care of the Yncas, to cut and arrange trenches in ſuch a manner, as to conduct the water of the rivers to irrigate the ſoil; and when the Spaniards took poſſeſſion of the country, they purſued the ſame plan; thus they watered the ſpacious fields of wheat and barley, large meadows, plantations of ſugar canes, and olive trees, vineyards, and gardens of all kinds, which were rendered very productive. By the earthquake in 1687, the ſoil was ſo vitiated, that it became unfit for yielding wheat and barley; but after remaining 40 years in this ſtate of ſterility, it again ſo far recovered itſelf as in a conſiderable degree to become fit for grain as before. However, repeated earthquakes have been unfavourable. The fields in the neighbourhood of Lima are chiefly ſown with clover, of which there is a very great conſumption, as it is the common fodder for all beaſts, particularly mules and horſes, of which there is an inconceivable number. The bread at Lima is the beſt in all this part of America, both with regard to its colour and taſte. The mutton and beef are alſo very good; and here is alſo plenty of poultry, pork, and fiſh; which latter article is ſupplied by the Indians of the coaſt, from the bay of Callao, and the villages of Cherillo and Luria. The river of Lima, and the coaſts, furniſh anchovies and various ſorts of ſhell-fiſh. The wines at Lima are of different ſorts, white, red, and dark-red, and of each ſort ſome are peculiarly excellent. They are imported from the coaſts of Naſca, Piſco, Lucumba, and Chili, but the latter produces the beſt. That from Piſco has the greateſt ſale, and from the ſame place all the brandies uſed at Lima or exported are brought. Many of the dried fruits are brought from Chili, and by the trade carried on between the two kingdoms, Lima is ſupplied with all ſorts of fruits known in Spain. At Lima there are no fabrics nor manufactures of any kind. Lima owes much of its magnificence and ſplendour to its being the capital of Peru, and the general ſtaple of the kingdom. As it is the reſidence of the government and chief tribunals, it is alſo the common factory for commerce of every kind, and the centre of the products and manufactures of the other provinces, together with thoſe of Europe, brought over in the galleons or regiſter ſhips; and diſtributed from hence through the wide extent of theſe kingdoms. At the head of the commerce is the tribunal del Conſulado, which appoint commiſſaries to reſide in the other cities of its dependencies, extending through all Peru. The chief commerce of Lima is with Valparaiſo, Concepcion, and Coquimbo, in the kingdom of Chili; the iſle of Chiloe, and Arica, Ilo, and Piſco in the ſouth; towards the north with Truxillo, Pacaſmayo, and Payta, in the viceroyalty of Peru; with Guayaquil and Panama in the viceroyalty of New Granada; and with Realejo in Guatamala, and Acapulco, in Mexico. This trade is conducted by 10 ſhips, 11 merchant-frigates, 19 packet-boats, and a balandra, or ſmall tranſport-boat; amounting in all to 351,500 quintals of tonnage, navigated by 460 ſeamen. After the deſtruction of the ſea-port town of Callao by an earthquake in 1747 (ſee CALLAO), a new town or village was founded, at the diſtance of a quarter of a league, called "Ballaviſta." There is a fortreſs called "San Fernando," with a ſufficient garriſon to defend the bay, which in the S.W. is fenced by a barren iſland called "San Lorenzo." Here all the ſhips anchor about two leagues from Lima. The coaſts of Naſca and Piſco ſend to Lima wine, brandy, raiſins, olives, and oil; and the kingdom of Chili, wheat, flour, lard, leather, cordage, wines, dried fruits, and ſome gold. Every Monday, during the whole year, there is a fair at Callao, whither the traders or proprietors of commodities reſort from all parts; and the goods are carried, according to the directions of the buyers, on droves of mules kept for this purpoſe by the maſters of the warehouſes. Copper and tin in bars are brought from Coquimbo; from the mountains de Caxamarea and Chacapoyas, canvas made of cotton for ſails and other ſtuffs of that kind, and Cordovan leather and ſoap are made all over Valles, the valley in which Lima is ſituated. From the ſouthern provinces, as Plata, Oruro, Potoſi, and Cuzco, is ſent Vicuna wool, for making hats and ſome ſtuffs of a peculiar firmneſs. From Paraguay, the herb called by that name is ſent, of which there is a great conſumption. The produce of the ſales in the inland parts of the kingdom is ſent to Lima in bars of ſilver, and pignas, which are porous and light maſſes of ſilver, being an amalgam of mercury and duſt taken out of the mines. The ſilver is coined at the mint in this city. Lima has alſo its particular trade with the kingdoms both of North and South America. The moſt conſiderable commodity received from the former is ſnuff, which is brought from the Havannah to Mexico, and after having been there improved is forwarded to Lima, and conveyed from thence to the other provinces. There is no province in Peru, that does not tranſmit to Lima its products and manufactures; and ſupply itſelf from hence with the neceſſary commodities.

Lima alſo receives from the ports of New Spain, naphtha, tar, iron, and ſome indigo for dyeing. The kingdom of Terra Firma ſends to Lima, leaf-tobacco and pearls, which find here a good market, as no mulatto woman is without ſome ornament made of them. The ladies and women of all ranks have an ancient cuſtom of carrying in their mouths a "limpion," or cleanſer, of tobacco. The intention of theſe is, as their name imports, to keep the teeth clean. The limpions are ſmall rolls of tobacco, four inches long and nine lines in diameter, tied with a thread which they untwiſt as the limpion waſtes. One end of this they put into the mouth, and after chewing it for ſome time, rub the teeth with it, thus keeping them always clean and white. All the timber uſed in building houſes, refitting ſhips, or conſtructing ſmall barks at Callao, is brought from Guayaquil, together with the cacao. S. lat. 12° 2′ 31″. E. long. 282° 27′. See Juan and De Ulloa's Voyage to South America, and Eſtalla, cited by Pinkerton's Geography. For further particulars, ſee PERU.

LIMA, a river of Spain, which riſes in the province of Galicia, traverſes the province of Entre Duero e Minho, and runs into the Atlantic, two miles below Viana. N. lat. 41° 40′. W. long. 8° 30′.—Alſo, a town of Arabia, in the province of Oman, near the coaſt; 32 miles S.E. of Julfa.

LIMACHU, a river of Chili, which runs into the Pacific ocean, S. lat. 30° 25′.

LIMACIA, in *Botany*, ſo named by Loureiro, from *limax*, a ſnail, in alluſion to the ſpiral furrows on its nut.—Loureir. Cochinch. 620.—Claſs and order, *Diœcia Hexandria*. Nat. Ord. *Sarmentaceæ*, Linn. *Aſparagi*, Juſſ.

Gen. Ch. Male-flowers nearly terminal, crowded together. *Cal.* Perianth inferior, ſhort, of ſix acute leaves, the alternate ones ſmaller, arranged altogether horizontally in a triangle. *Cor.* Petals three, triangular, almoſt erect, longer than the calyx; nectary equal to the calyx, divided into ſix, roundiſh, concave, fleſhy ſegments. *Stam.* Filaments ſix, very ſhort, each placed upon a ſegment of the nectary, and altogether forming a triangle; anthers of two cells, roundiſh.—Female flowers axillary, in pairs, on a ſeparate plant. *Cal.* as in the male. *Cor.* Petals ſix, roundiſh, curved, unequal; nectary equal to the calyx, divided into ſix, turbinate, connivent ſegments. *Piſt.* Germen ſuperior, ſomewhat triangular; ſtyle none; ſtigmas three, many-cleft, ſpreading. *Peric.* Drupa fleſhy, rather kidney-ſhaped, containing a ſingle ſeed. *Nut* ſpirally furrowed like a ſcrew, the kernel ſimple.

Eſſ. Ch. Male, Calyx of ſix leaves. Corolla of three petals.—Female, Calyx of ſix leaves. Corolla of ſix petals. Stigmas three. Drupa kidney-ſhaped, ſpiral.

1. L. *ſcandens.* Cay Mè gà of the Cochinchineſe, and found in the woods of Cochinchina.—*Stem* ſhrubby, climbing, without tendrils, long, much branched. *Leaves* alternate, ovate-oblong, acuminate, entire, ſmooth. *Flowers,* both male and female, yellowiſh-green. *Drupa* ſmall, ſmooth, acid and eſculent.

LIMADASI, in *Geography,* a town of Curdiſtan, on an iſland in the lake Van.

LIMANDA, in *Ichthyology,* a name by which ſome authors have called the flat-fiſh, which we in Engliſh call the *dab,* the *paſſer aſper* of authors.

LIMARIA, a name given by Gaza and ſuch other writers to the thynnus or tunny-fiſh, called the *Spaniſh mackrel.*

LIMASOVA, in *Geography,* one of the ſmaller Philippine iſlands, near Leyta. N. lat. 10° 1′. E. long. 125° 2′.

LIMASSOL. See LIMESOL.

LIMATAMBA, a town of Peru, in the dioceſe of Cuzco; 25 miles W. of Cuzco.

LIMATURA *Martis Præparata.* See IRON.

LIMAX, in *Natural Hiſtory,* the ſlug or ſnail, a genus of the Vermes Molluſca, claſs and order, of which the character is;—Body oblong, creeping, with a fleſhy kind of ſhield above, and a longitudinal flat diſk beneath; aperture placed on the right ſide, within the ſhield; feelers four, ſituated above the mouth, with an eye at the tip of each of the larger ones.

This genus, of which there are fifteen ſpecies mentioned in the Syſtema Naturæ, comprehends thoſe animals that are commonly known by the name of ſlugs, or naked ſnails, which commit ſuch depredations in our fields and gardens, eſpecially in wet weather. Of the fifteen ſpecies ſix are common in our own country.

Species.

LEVIS. Body black, and almoſt without wrinkles. It is found among moſs late in the autumn, and is about half an inch long. The body is gloſſy, with undulate tranſverſe ſtriæ on the ſhield; narrower, and not ſo much wrinkled as the *ater,* which is the next mentioned.

ATER, or black ſlug; body black and furrowed with deep wrinkles. Of this ſpecies five varieties are enumerated: 1. The colour of this is deep black and pale beneath. 2. Black, with a pale greeniſh ridge down the back. 3. Black, beneath white; mouth yellowiſh. 4. Cheſnut-brown, beneath white; mouth yellowiſh. 5. Duſky-brown, with a yellowiſh mouth and ſtreak each ſide. This laſt is common in woods, meadows, fields, and gardens; and is from an inch and a half to five inches in length; it crawls very ſlowly, and leaves a ſlime upon whatever it paſſes over; feelers always black; the back is convex; the ſhield rough, with numerous dots; abdomen wrinkled.

ALBUS. This ſpecies, which is characterized by the whiteneſs of its body, contains four varieties. 1. The entirely white. 2. White edged with yellow. 3. White, with an orange margin and hind-head. 4. White, with black feelers; it inhabits woods and groves, and is from a quarter to half an inch in length.

RUFUS. Body, above pale rufous, beneath white; it inhabits ſhady damp places, and the bottom of hills, is about an inch and a half long; the body has neither ſpots nor belts; its feelers are larger than thoſe of the ater.

FLAVUS. Body amber-colour ſpotted with white, and is found in herbage.

MAXIMUS. Body cinereous, with or without ſpots; there are ſix varieties, *viz.* 1. Body immaculate; ſhield black-blue. 2. Shield ſpotted with black; body with black longitudinal ſtripes. 3. Shield and body ſpotted with black. 4. Body with five whitiſh ſtreaks, the lower one interrupted. 5. Body with white and cinereous wrinkles, and black ſpots in a double row. 6. Body edged with white; inhabits woods, gardens, and damp cellars; is from four to five inches long.

HYALINUS, takes its name from the colour of its body, which has a hyaline or glaſſy appearance; feelers obſolete, with a brown line reaching from the feelers to the ſhield; this is found in damp moſſy places, and is very deſtructive to the young ſhoots of kidney-beans; belly with numerous interrupted wrinkles.

AGRESTIS. Ruſtic ſlug; body whitiſh, with black feelers; this ſpecies is divided into four varieties, of which the 1, is entirely whitiſh, immaculate; 2, whitiſh, with a yellowiſh ſhield; 3, whitiſh, with a black head; 4, whitiſh, with a cinereous back; 5, whitiſh, with ſcattered black ſpecks.

The moſt curious of the above varieties is the ſecond, that with a yellowiſh ſhield, or that which is characterized by Müller, in his Hiſt. Verm. "Limax albidus clypeo flaveſcente," or by Gmelin, "Limax albus, clypeo flaveſcente;" it has been figured by Liſter, but more accurately, and with great care, in the fourth volume of the Linnæan Tranſactions, in which it is exhibited in a ſtate of repoſe, as it is ſeen in its progreſſive motion on the ground; and alſo as it is obſerved ſuſpended from the branch of a tree, &c. both with reſpect to its upper and under ſurfaces. This variety is denominated in our own language the *ſpinning ſlug,* and is commonly about three quarters of an inch long; it inhabits woods and other ſhady places. It was particularly noticed by Mr. Hoy, and deſcribed in the firſt volume of the Tranſactions of the Linnæan Society; at firſt he ſaw it ſuſpended from the branch of a fir tree, and was not aware that it was a living creature. It was hanging by a ſingle line or thread attached to its tail. This thread was in the upper part extremely fine, but near the animal it became thicker and broader, till at length it exactly correſponded with the tail. Its deſcent was at the rate of an inch in three minutes, a motion ſufficiently ſlow for the minuteſt obſervations. The line by which it deſcended was drawn from the ſlimy exudation gradually ſecreted from the pores that covered its whole body. Apparently there was much exertion required to produce a ſufficient ſupply of the liquid, and to force it towards the tail; it alternately drew back its head, and turned it as far as poſſible, firſt to one ſide, and then to the other, as if to preſs its ſides, and thus promote ſecretion.

In addition to Mr. Hoy's account, we ſhall give ſome farther particulars, taken from a curious paper by Dr. John Latham, in the fourth volume of the Linnæan Tranſactions; a work that contains abundance of intereſting matter, but which is too expenſive to have a very general circulation beyond the members of the ſociety. Speaking of the curious property belonging to the ſpinning ſlug, the doctor ſays, "that it is a cuſtom not unuſual for this ſpecies of limax to paſs from an height ſecurely to the ground, by means of a thread of its own conſtruction ſeems manifeſt; for, on my friend's (Colonel Montague, F.L.S.) putting one of them on the projecting frame of a window, it immediately crawled forwards till it came to the projecting angle, from whence, without attempting to fix itſelf by its fore parts to any thing, it became viſibly ſuſpended by a thread from its tail. When it had deſcended two feet, the colonel took it up by the thread, and carried it to a diſtant room; but trying to fix it afreſh, in order more accurately to obſerve its progreſs, the thread broke. He then put it on a frame about four feet from the ground; in a few minutes it was again ſuſpended, and obſerving by his watch, it deſcended at the rate of three inches and a half in a minute." After repeated trials, the colonel, by means of glaſſes, was enabled to aſcertain that the ſecretion, of which the thread was formed, was wholly from the under parts, and not from the back and ſides, both of which appeared nearly dry, nor did it proceed from any orifice in the tail. This creature ſeems quite ſenſible of its abilities, for it extended itſelf from the bottom of the frame, with its head downwards, till the tail became ſuſpended; and it was by means of an undulating motion of the belly that the flow of the viſcous ſecretion was produced towards the tail, but in doing this the belly was contracted, being furniſhed with numerous tranſverſe *rugæ;* at the ſame time the body and tentacula were fully extended, indicating no alarm whatever; the head was occaſionally moved from ſide to ſide, which gave ſeveral turns to the right or left, as the centre of gravity lay; but as it as frequently turned one way as the other, the thread was not in the leaſt twiſted. The thread, on firſt leaving the tail, was five times as broad as it was at the eighth of an inch diſtant therefrom, but afterwards ſeemed of an equal ſize, and conſiderably ſmaller than the fineſt human hair. When a portion of this thread was placed under a microſcope, it appeared contracted; it was pellucid and elaſtic. By another writer on this ſubject we are told, that by the application of the microſcope, the ſlimy humour will be ſeen to come out inſenſibly from the glandular pores of the ſkin, like clear and minute points; theſe, by continuing a gentle preſſure on the ſkin, will become ſmall drops, and in the end form a conſiderable collection of matter. It may be alſo obſerved, that colonel Montague found ſeveral individuals of this variety that he could not induce to ſpin, and, as if ſenſible of their inability ſo to do, readily turned back when approaching the projected edge; while others at once let themſelves down without heſitation; ſo that it might be known by their motion, when near the brink of the precipice, whether they were endued with the faculty or not. After theſe animals have ſpun for ſome time, their ſpinning power ſeems to be for a while loſt, but in all thoſe on which experiments have been made, it has been recovered again by keeping them for a few hours among wet moſs.

The fifth variety above-mentioned, or that with ſcattered black ſpecks, is found in gardens, paſtures, and groves, from May till the end of the year, and is the animal which has been recommended to be ſwallowed by conſumptive perſons. It is about half an inch in length, and when touched it ſticks to the fingers as if dead.

Cinctus. This ſpecies is yellowiſh, with a cinereous belt on the ſhield and body; it is commonly found in groves, and is about two inches long; body without ſpots, and beneath it is white.

Marginatus. This is cinereous; ſhield with a duſky ſtreak on each ſide: the body is of a pale blueiſh colour; it is found on the beech; back with a white ridge, each ſide of which is blueiſh-aſh; abdomen ſometimes ſpotted black.

Reticulatus. Brown, with black dots on the ſhield and lines on the body; it inhabits gardens in Denmark and Germany; it is an inch and a half long.

Aureus. Yellow, immaculate, with black feelers; it inhabits the groves of Denmark and Norway, is about half an inch long. The body beneath is white, with a black line between the feelers.

Fuscus. This is of a reddiſh hue, with a blackiſh lateral line and back.

Tenellus. Greeniſh, with black head and feelers; is found, early in the ſpring, in hollows of woods filled with dry leaves; about an inch long; the ſhield whitiſh with a yellowiſh caſt.

Lanceolatus. Linear-lanceolate and very ſharp at each end; the margin ſurrounded with a membranaceous border; without tentacula or feelers; found on the coaſt of Cornwall.

Limax *Marinus*, in *Zoology*, a name given by ſome to the *lipparis*, or, as it is commonly termed in Engliſh, the *ſea-ſnail*, caught in plenty at the mouths of rivers in Yorkſhire, and ſome other places. See Cylindrus.

LIMAY, in *Geography*, a town of France, in the department of the Seine and Oiſe, and chief place of a canton, in the diſtrict of Mantes; ſituated on the Seine, oppoſite to Mantes. The place contains 1520, and the canton 9881 inhabitants, on a territory of 137½ kiliometres, in 17 communes.

LIMB, in *Anatomy*, is uſed to denote certain parts of the human body, proceeding from the trunk. See Extremities.

The limbs, as well as the life of a man, are of ſuch high value in the eſtimation of the law of England, that it pardons even homicide, if committed *ſe defendendo*, or in order to preſerve them.

Limbs, *Amputation of*, in *Surgery*. See Amputation.

Limbs, *Artificial*. Under this denomination, ſurgical writers ſpeak of the various machines and contrivances which have been invented for ſupplying the place, and in ſome meaſure executing the office, of limbs which are naturally imperfect or wanting, or which have been amputated, or otherwiſe loſt. Anciently, it was as much the duty of the ſurgeon to provide his patient with a wooden leg after amputation, as to cut off the member, which endangered life and could not be preſerved. At preſent, however, the buſineſs of furniſhing artificial limbs is left almoſt entirely to the mechanic, though it cannot be denied, that the attention of a judicious ſurgeon will often be well beſtowed in taking care, that the preſſure of ſuch machines is contrived to fall as little as poſſible upon that part of a ſtump which is moſt tender, and inclined to ulcerate. The end of a thigh-ſtump, indeed, can ill bear the effects of preſſure, and in this caſe, it is uſual to make the thigh part of the wooden member in the form of a conical box, which is calculated to receive the ſtump, and at the ſame time not allow the end of the bone to meet with any material reſiſtance below. The preſſure partly falls on the ſides of the remaining portion of the thigh, and partly on the pelvis, round which a ſtrap proceeds from the upper part of the machine. The makers of artificial limbs in this metropolis, however, have in general brought their buſineſs to great perfection, and ſuch patients as can afford it, may be accommodated with contrivances, which, without being heavy and cumberſome, bear a great reſemblance to the natural limb. Artificial hands and arms may alſo be procured, which have moveable fingers, and by the ingenuity of the mechaniſm, may be made to perform many little uſeful offices in graſping and holding things.

Limbs, *Diſlocations of*. See Luxation.

Limbs, *Fractures of.* See Fracture.

Limb, *Limbus*, the outermoſt border, or graduated edge, of an aſtrolabe, quadrant, or the like mathematical inſtrument.

The word is alſo uſed for the primitive circle in any projection of the ſphere in plano.

Limb alſo ſignifies the outermoſt border or edge of the ſun or moon, when the middle or diſk is hid in an eclipſe of either luminary.

Aſtronomers obſerve the lower and upper limb of the ſun in order to find out its true height, which is that of the centre.

Limb is alſo uſed, among *Botaniſts*, for the outer edge or border of plants, their leaves and flowers. See Petal.

LIMBÉ, in *Geography*, an iſland in the Eaſt Indian ſea, about 12 miles long, and 3 broad, near the E. coaſt of Celebes. N. lat. 1° 18'. E. long. 125° 10'.—Alſo, a ſmall town or village in the N.W. part of the iſland of St. Domingo; ſeven leagues W. by S. of cape François.

LIMBECK. See Alembic.

LIMBERG, in *Geography*, a town of the duchy of Stiria; 12 miles S. of Voitſberg.

LIMBERS, in *Artillery*, a ſort of advanced train joined to the carriage of a cannon, upon a march. See Carriage.

Limber-*holes*, in a *Ship*, little ſquare holes cut through her floor-timbers, ſerving to let the water to the well of the pump, which otherwiſe would lie between thoſe timbers, where the keel rope runs.

Every floor-timber has two limber-holes cut through it; *viz.* one on each ſide of the keelſon.

Limber *boards*, are ſhort pieces of plank, which form a part of the cieling or lining of a ſhip's floor, cloſe to the keelſon, and immediately above the limbers. They are occaſionally removed, in order to examine and clear the limber-holes.

Limber-*rope*, is a long rope, frequently retained in the limber-holes of a ſhip, and communicating from one to another, in order to clear them, by pulling the rope backwards and forwards, ſo as to looſen the ſand or dirt by which they may occaſionally be choaked.

LIMBEUO, in *Geography*, a town on the E. coaſt of the iſland of Celebes. N. lat. 0° 18'. E. long. 123° 18'.

LIMBOBARYA, a town of Bengal; 30 miles N.W. of Nattore.

LIMBORCH, Philip, in *Biography*, a celebrated Dutch divine, was born at Amſterdam in the year 1633. He was educated among the Remonſtrants, and had for his inſtructors among others, Barleius, and Gerard Voſſius. Having completed the uſual courſes of learning, in ethics, philoſophy, and the languages, he ſtudied theology under Curcellæus, the ſucceſſor of Epiſcopius, in the profeſſorſhip of that faculty, among the Remonſtrants at Amſterdam. Afterwards he went to Utrecht, where he attended the lectures of Gilbert Voetius, and other celebrated divines. In 1654 he undertook the office of miniſter at Haerlem, from whence he removed to Gouda. In 1660 he publiſhed an excellent collection of the correſpondence of learned and celebrated men, under the title of "Epiſtolæ præſtantium, et eruditorum virorum," 8vo. In 1684 and 1704 he publiſhed new editions of it, greatly enlarged, in folio. In this collection, almoſt the entire hiſtory of the affairs of the Remonſtrants may be traced from the time of Arminius down to the ſynod of Dort. In 1661 he publiſhed, in the form of a dialogue, a treatiſe in defence of toleration, which was exceedingly well received by the friends of liberty. In 1667 he undertook the paſtoral charge of the church at Amſterdam, and in the following year he was appointed divinity profeſſor. From this period he wholly devoted his ſtudies to the enquiries connected with his new office, and acquired a high reputation by the manner in which he performed its duties. In the year 1686 he publiſhed his ſyſtem of theology, under the title of "Theologia Chriſtiana ad Praxim Pietatis ac Promotionem Pacis Chriſtianæ unice directa." It paſſed very quickly through four editions. In this ſame year Limborch had a diſpute with Orobio, a Spaniſh Jew, who had eſcaped from the priſon of the Inquiſition, and ſoon after he publiſhed the ſubſtance of it in a treatiſe, entitled "Collatio Amica de Veritate Religionis Chriſtianæ, cum erudito Judæo." This treatiſe very ſatisfactorily repels the objections which any conſiſtent believer in the Old Teſtament can advance againſt the New. He obtained, in 1692, "The Book of Sentences of the Inquiſition of Tholouſe from 1307 to 1313," which he publiſhed, and prefixed to it a hiſtory of that horrible and bloody tribunal drawn from the writings of the inquiſitors themſelves. The title of it is "Hiſtoria Inquiſitionis; cui ſubjungitur Liber ſententiarum Inquiſitionis Tholoſanæ, ab anno 1307 ad 1313," 4to. This hiſtory is pronounced, by Mr. Locke, to be a work abſolutely perfect in its kind; it was tranſlated by Dr. Samuel Chandler into Engliſh, in two volumes 4to. with additions by the editor, by Anthony Collins, eſq. and by the author. Dr. Chandler prefixed to his edition an introduction, concerning the riſe and progreſs of perſecution. In 1694 he converted a young woman to Chriſtianity who had been drawn over to the Jewiſh religion by a perſon of whom ſhe had learned the Hebrew language. In 1711 Limborch publiſhed his valuable "Commentarius in Acta Apoſtolorum et in Epiſtolas ad Romanos, et ad Hebræos." He died in the month of April 1712, in the ſeventy-ninth year of his age. A funeral oration was delivered on the occaſion by Le Clerc, who, among other things, ſays, "He was, above all things, animated with the love of truth, and was indefatigable in ſearching for it, day and night, in the ſacred ſcriptures and the beſt expoſitors, and whenever he found it, he adhered to it inflexibly. His piety was pure and ardent, untinctured by ſuperſtition, or any notions diſhonourable to the benevolence of the Deity. As a preacher he was methodical, argumentative, and ſolid rather than eloquent; and ſo invariably was he governed by candour, moderation, and prudence, that he never gave offence to any one. In his inſtructions from his profeſſional chair, he was diſtinguiſhed by the greateſt perſpicuity, and the moſt exact order; to which his memory, which retained whatever he had written, no doubt greatly contributed. His behaviour towards all who had the happineſs of being acquainted with him, was ſo affable, kind, and conciliating, that they ſaw him with delight, and regretted, when they could no longer enjoy his converſation." Gen. Biog. Moreri.

LIMBOURG, John Philip de, a phyſician at Spa, who obtained a great reputation by his knowledge of the properties of the mineral waters, and by the ſucceſs with which he preſcribed them in many obſtinate diſeaſes, which had reſiſted other remedies. He reſided at Spa during the ſeaſon of drinking the waters. He publiſhed ſeveral works, the principal of which detail the reſult of his obſervations on their properties and uſes; *viz.* "Diſſertation ſur les Eaux de Spa, ſoutenue à Leyde, le 7 Août, 1736, &c." Liege, 1749, 12mo. "Traité des Eaux Minerales de Spa," Leyden, 1754, 12mo. "Diſſertations ſur les Bains d'Eau ſimple, tant par immerſion, qu'en douches et en vapeurs," Liege 1757, 12mo. "Caractères des Médecins, ou l'idée de ce qu'ils ſont communément, et celle de ce qu'ils devroient être, &c." ibid. 1760, 12mo. "Diſſertation ſur les Affinités chymiques, qui a remporté le prix de Phyſique de l'an 1758, au jugement de l'Académie de Rouen," ibid. 1761, 12mo. "Nouveaux Amuſemens des Eaux Minerales de Spa," ibid. 1763, 12mo. "Diſſertation ſur les douleurs vagues, connues ſous le nom de goutte vague, et de rheumatiſme goutteux, &c.;" a prize eſſay, ibid. 1763. "Recueil des Effets des Eaux Minerales de Spa, de l'an 1764; avec des remarques ſur le ſyſtème de M. Lucas ſur les mêmes eaux minerales," ibid. 1765. Eloy. Dict.

LIMBOURG, *Duchy of*, in *Geography*, before the revolution, was a province of the Netherlands, bounded on the N. by the duchy of Juliers, on the E. by the electorate of Cologne and duchy of Juliers, and on the S. and W. by the biſhopric of Liege; about 30 miles long and 24 broad; but now annexed to France, and forming part of the department of the Ourte. It affords good arable ground, and abounds with a fine breed of cattle. Near the town of Limbourg are found mines of iron, lead, and calamine.

LIMBOURG, late capital of the above-mentioned duchy, now a town of France, in the department of the Ourte, and chief place of a canton, in the diſtrict of Malmédy; ſituated near the river Waze, in a fertile country, on a pleaſant mountain. It was formerly fortified in a regular manner, and had a caſtle, built on a rock, and defended by towers and baſtions, conſtructed of free-ſtone. When it was ceded to the houſe of Auſtria by the treaty of Baden, the fortifications were deſtroyed. Near it are quarries of different kinds of marble; the adjacent rocks are romantic; the air is healthy, and the inhabitants long-lived. Here is a conſiderable manufacture of woollen cloth; and in its environs ſome excellent cheeſe is made. The town is ſaid to contain 1484, and the canton 12,759 inhabitants, on a territory of 152½ kiliometres, in 12 communes; 20 miles E.S.E. of Liege. N. lat. 50° 36′. E. long. 23° 30′.

LIMBRA, a town of Hindooſtan, in Guzerat; 35 miles W. of Gogo.

LIMBRY, a town of Hindooſtan, in Guzerat; 68 miles W. of Amedabad.

LIMBURG, a lordſhip and principality of Germany, belonging to the circle of Franconia, but ſituated in Swabia; extending from S. to N. almoſt 20 miles, and from W. to E. 18 miles.—Alſo, a town of Germany, ſeated on the Lahn; 26 miles N. of Mentz. N. lat. 50° 20′. E. long. 8° 3′.—Alſo, a town and citadel of Germany, called *Hohen-Limburg*, which gives name to a county, a fief of the county of Mark, in which it is inſulated; about 15 miles long and 12 broad; 30 miles E. of Duſſeldorp.

LIMBUS, or LIMB, is a term in the *Roman Theology*, uſed for that place where the patriarchs are ſuppoſed to have waited for the redemption of mankind, and where they imagine our Saviour continued from the time of his death to that of his reſurrection.

Du-Cange ſays, the fathers call this place *limbus, eo quod ſit limbus inferiorum*, as being the margin or frontier of the other world.

LIMBUS is alſo uſed by Catholics for the place deſtined to receive the ſouls of infants, who die without baptiſm; who have not deſerved hell, as dying in innocence; nor yet are worthy of heaven, becauſe of the imputation of original ſin.

LIMBUS *Corollæ*, in *Botany*, the expanded part, or border, of a monopetalous corolla, ſupported by the tube, and analogous to the *lamina* of each petal in a polypetalous one. See COROLLA and LAMINA.

LIMBUYAN, in *Geography*, a town on the S. coaſt of the iſland of Maſbate. N. lat. 12° 8′. E. long. 123° 36′.

LIME, LIME-STONE, in *Mineralogy*, *Kalkſtein*, Germ. *Pierre calcaire, Chaux carbonatée*, Fr. This ſpecies of the carbonates of lime is divided by Werner into four ſubſpecies. 1. Compact lime-ſtone. 2. Foliated lime-ſtone. 3. Fibrous lime-ſtone. 4. Pea-ſtone.

1. *Compact lime-ſtone*, is ſubdivided into common compact lime-ſtone, and roe-ſtone.

A. *Common compact lime-ſtone; Gemeiner dichter kalkſtein*, Wern. *Pierre calcaire compacte commune*, Broch. *Chaux carbonatée compacte ou groſſière*, Haüy. *Compact lime-ſtone*, Kirwan. *Tätt kalkſten*, Swed.

Among the numerous colours of common compact lime-ſtone, the moſt frequent are the various ſhades of grey, ſuch as ſmoke-grey, yellowiſh-grey, bluiſh-grey, reddiſh and greeniſh-grey; it is alſo ſeen greyiſh-white, greyiſh-black, fleſh-red, with ſome deep tints of red and of yellow; ſeveral of theſe colours often occur in the ſame fragment, and moſtly in ſuch veined, clouded and other delineations which are diſtinguiſhed by the epithet of *marbled*.

It is moſtly found maſſive, ſometimes in rolled, ſeldom in tabular pieces, frequently with, and almoſt entirely compoſed of, extraneous foſſils, particularly ſhells.

Internally it is dull. Its texture is always more or leſs cloſely compact, ſometimes wax-like; fracture ſmall and fine ſplintery paſſing into large and flat conchoidal, and ſometimes into even. Fragments indeterminately angular, more or leſs ſharp-edged.

The varieties having a cloſe texture are tranſlucent on the edges.

It is ſemi-hard, ſometimes approaching to ſoft; brittle; eaſily frangible.

Specific gravity from 2.500 to 2.700.

It is chiefly compoſed of lime, carbonic acid, and water; but is ſeldom without an admixture of ſome argil and oxyd of iron, and ſometimes inflammable matter.

This widely extended ſubſtance occurs principally as fletz rock, but it is alſo found in the tranſition mountains.

The tranſition lime-ſtone is generally more tranſlucent on the edges, and very often exhibits variegated colours, particularly black, ſmoke-grey, bluiſh and greeniſh-grey, and red. It contains, like the fletz lime-ſtone, petrifactions, but moſtly of ſea animals, the prototypes of which do no longer exiſt. With regard to the petrifaction, both in the tranſition and fletz lime-ſtone, it is to be obſerved, that they occur pretty regularly diſpoſed; different ſtrata being generally furniſhed each with particular genera or even ſpecies.

Fletz lime-ſtone occurs, almoſt without exception, diſtinctly ſtratified; the ſtrata are ſometimes very thin, of which we have a remarkable inſtance in the lime-ſtone quarries of Sollenhofen, near Pappenheim, in Germany. Theſe ſtrata, which, as Mohs informs us, are very regular and perfectly horizontal, contain the well-known petrifactions which are called after that place, but are much leſs frequently found than is generally imagined.

M. de Bournon ſays, that in the Alps of Dauphiné lime-ſtone is found in ſtrata of no more than one or two inches in thickneſs, in which caſe it is not unfrequently mixed with quartz. This lime-ſtone in tables, called *lauſes* in Dauphiné, is employed for encloſing fields: a ſimilar variety is found at Grenoble at the foot of the mountains of Saſſenages.

Fletz lime-ſtone is frequently alternating with ſubordinate ſtrata of marle, and bituminous marle ſlate; but in theſe caſes the lime-ſtone is generally greatly predominating. The exterior of mountains compoſed of fletz lime-ſtone is of a peculiar kind; the hills formed by it are ſeldom conical, but blunt and maſſy, and interſected by deep vallies.

There are, beſides the tranſition lime-ſtone, ſeveral other formations of compact lime-ſtone. That called by Werner the *firſt fletz lime-ſtone* is the oldeſt; its loweſt ſtratum is the bituminous and cupriferous marle ſlate, or the *kupfer-ſchiefer-fletz*, as it is called by German miners: it extends round a great part of the oldeſt mountains of Germany, ſuch as the Hartz, the Thuringian foreſt, Suabia, &c. reſts on the old red ſand-ſtone, and is covered by the oldeſt fletz gypſum, or the variegated ſand-ſtone. It contains, beſides the above copper ſlate ſtrata, ſeveral ores of copper, cobalt, heavy ſpar, &c. being the productions of veins.

The ſecond formation of fletz lime-ſtone is called *ſhell-lime-ſtone*, on account of its abounding in petrifactions, which, however, are not peculiar to it, nor do they conſiſt in ſhells only, for the upper ſtrata contain likewiſe petrified crabs, vermiculites, ſpecies of aſterias, &c. (See SHELLS, *petrified*, and MARBLE.) It is widely extended, and appears moſt characteriſtic in Franconia, Suabia, and Bavaria. This formation is alſo remarkable, on account of the many caves which occur in it almoſt in all parts of the world, and many of them filled with the oſſeous remains of land animals. The moſt famous of theſe lime-ſtone caves are thoſe of Muggendorf and Galenreuth in Bayreuth, at Eichſtedt in Franconia, the Baumanſhole on the Hartz, thoſe of Dalmatia, Carniola, Hungary, Siberia, &c.

There are ſome other ſubordinate formations of fletz-lime-ſtone; which, however, require to be more cloſely examined before their characters can be determined with any thing like preciſion. Of ſuch apparently diſtinct depoſitions the following are mentioned by profeſſor Jameſon. 1. A fletz lime-ſtone, in Poland and Sileſia, which alternates with beds of lead-glance and calamine. It was formerly called the calamine formation, and Karſten conſiders it as ſubordinate to the firſt fletz lime-ſtone, but, according to Werner, it belongs to the ſecond. 2. A depoſit of lime-ſtone between Dreſden and Meiſſen, particularly near Plauen and in the vicinity of Göttingen, which was conſidered as a third fletz lime-ſtone formation, but is now claſſed as a mere variety of the ſecond fletz lime-ſtone: it is generally ſandy, or mixed with clay, and is therefore ſeldom uſed as lime, but principally employed as a building ſtone. It often contains petrifactions, ſuch as corallites, ammonites, &c. and ſometimes lead-glance is diſſeminated through it. 3. A lime-ſtone formation at Wehrau, in Upper Luſatia, containing newer petrifactions, ſuch as pectinites, mytilites, &c.: it alternates with beds of ſand-ſtone, and the whole reſts upon alluvial land. 4. A fletz lime-ſtone of a reddiſh-brown colour, frequently containing petrifactions; it is horizontally ſtratified, and contains beds of a variety of alum ſlate. Alſo a conchoidal lime-ſtone of Greece is mentioned as probably conſtituting a particular formation.

The uſes to which compact lime-ſtone is applied are various; it is principally employed as a building ſtone, and burnt for making lime and mortar; nor is it leſs important to the agriculturiſt as a manure, to the miner as a flux for the reduction of ores, to the ſoap-boiler, tanner, &c.

The fine-grained and variegated varieties of compact lime-ſtone, many of which are highly valued, are known by the name of *marble;* a term which is more particularly applied to the fine varieties of granular lime-ſtone, and alſo given to various mixtures of lime-ſtone with other ſubſtances. See MARBLE.

B. *Roe-ſtone; Roogenſtein,* Wern. *Oviform lime-ſtone,* Kirw. *Oolite,* Broch. *Chaux carbonatée globuliforme,* Haüy. *Meconite, pſammite,* &c.

Its colour is generally yellowiſh-brown, paſſing into various deeper ſhades of brown, ſuch as hair-brown, clove-brown; it is alſo found ſmoke-grey, yellowiſh, and reddiſh-grey. The colour of the globules is often different from that of the marley maſs by which they are cemented together.

It is found maſſive. It is dull. Fracture fine ſplintery, a character not eaſily obſervable, on account of the ſmallneſs of the diſtinct concretions. Fragments indeterminately angular, blunt-edged.

It conſiſts of ſpherical, granular, diſtinct concretions; each of which is generally compoſed of concentric lamellar concretions, which are either cemented together by a marley ſubſtance, or connected by ſimple contact; the grains vary in ſize, and are often ſo minute as to be ſcarcely diſtinguiſhable by the naked eye; the largeſt are nearly of the ſize of a pea, but theſe are ſeldom ſeen. In ſome varieties each globule is an aggregate of ſeveral ſmaller globules.

It is opaque, ſeldom tranſlucent on the edges.

It is ſoft and ſemi-hard; brittle; eaſily frangible. Specific gravity 2.456 — 2.494, Kirw.

Its chemical character is little different from that of the common compact lime-ſtone. The variety analyſed by Kirwan was compoſed of 90 parts of carbonate of lime and 10 of alumine, with ſome oxyd of iron.

This ſub-ſpecies is much leſs frequently met with than common compact lime ſtone. It occurs, however, in conſiderable quantities at Brunſwic, in Thuringia, particularly in the diſtrict of Weimar, in that of Mansfeld, Sangerſhauſen, Kloſterroda, &c. in Tyrol; in England, at Bath, in Derbyſhire, at Purbeck.

It occurs chiefly, in more or leſs conſiderable beds, in the variegated ſand-ſtone formation, to which it is ſubordinate, and between the ſtrata of which it is generally interpoſed with great regularity. It contains no petrifactions, nor is it metalliferous.

Roe-ſtone, being very ſubject to diſintegration, is ſeldom employed for the purpoſes of building; but it is in ſome countries uſed as a manure. The more compact varieties take a tolerably good poliſh.

The name of roe-ſtone is given to this mineral on account of its cloſe reſemblance to fiſh-roes; indeed, the old mineralogiſts were ſo far miſled by the imitative form of this ſubſtance, that they really conſidered it as the petrified roes of fiſh.

The origin of the ſtructure of roe-ſtone is not eaſily explained; ſome have conſidered it as a conglomerate of rolled pieces of lime-ſtone; others have aſſigned the ſame origin to it as to the pea-ſtone; but Werner conſiders it as the reſult of cryſtallization.

2. *Foliated lime-ſtone; Blättriger kalkſtein* of Werner, who divides this ſub-ſpecies into two kinds: 1. Granular lime-ſtone. 2. Calcareous ſpar.

A. *Granular lime-ſtone. Körniger kalkſtein,* Wern. *Foliated and granular lime-ſtone,* Kirw. *Pierre calcaire grénue,* Broch. *Chaux carbonatée ſaccaroïde,* Haüy. *Granular,* or *ſaline marble, ſtatuary marble,* &c.

Its chief colour is white, often ſnow-white, greyiſh, yellowiſh, and greeniſh and reddiſh-white; alſo bluiſh, greeniſh, aſh and ſmoke-grey, and greyiſh-black; from greeniſh-white it paſſes into yellowiſh and olive-green, and from reddiſh-white into pearl-grey and fleſh-red. Its colours are moſtly uniform, but it alſo occurs ſometimes ſpotted, and with ſtriped and veined delineations; and on their rifts the maſſes are now and then marked with dendritic figures.

It is maſſive. Internally it alternates from ſhining to gliſtening and glimmering; its luſtre being intermediate between pearly and vitreous.

Fracture foliated; ſometimes, on account of the ſmallneſs of the particles, it appears almoſt compact and ſplintery. Fragments indeterminately angular, not particularly ſharp-edged. It occurs almoſt always in granular diſtinct concretions, which are coarſe, ſmall, and fine-grained.

It is generally tranſlucid; the dark-coloured varieties tranſlucent only on the edges.

It is ſemi-hard, ſometimes hard when mixed with ſiliceous and argillaceous particles; brittle; eaſily frangible; ſeldom elaſtic.

Specific gravity 2.707 (white Carrara), Muſchenbr;—2.717 (the ſame), Kirwan;—2.837 (Parian), Briſſon;—2.849 (white Saxon), Gellert;—2.836, (elaſtic var. from Campo Longo), Fl. de Bellevue.

Pure white granular lime-ſtone is infuſible before the blow-pipe, and only crumbles to pieces. In the charcoal crucible, that of Carrara was found by Klaproth to be burnt to quicklime; while in the clay crucible it was fuſed into a compact, tranſparent, hard glaſs of a light glaſs-green colour. It uſually ſtrongly effervesces with nitric acid, and when pure is ſoon diſſolved in it without leaving a reſidue.

Granular lime-ſtone is almoſt always of primitive formation; it ſeldom occurs as tranſition rock, and ſcarcely ever as a production of ſecondary mountains, or if it be found in theſe, it is never in extenſive depoſitions, but only in beds of not very conſiderable dimenſions. As tranſition rock it principally occurs on the Hartz; it is found there of a grey colour, and of coarſe granular texture.

Primitive granular lime-ſtone is ſeldom ſeen very diſtinctly ſtratified; it moſt commonly occurs in conſiderable beds in gneiſs, mica ſlate, and clay ſlate, in which latter the tranſition lime-ſtone appears, which, however, principally belongs to compact lime-ſtone. It is generally ſimple, but alſo contains ingredients which are characteriſtic of it, ſuch as mica, quartz, ſerpentine, tremolite, hornblende, clay ſlate, garnets, magnetic iron-ſtone, blende, &c. Mixed with noble ſerpentine it conſtitutes the *verde antico*.

The common varieties are employed for the ſame purpoſes as compact lime-ſtone; the finer are among the moſt ſplendid and deſirable materials for ſtatuary and architecture, and for the decoration of the interior of houſes. See MARBLE, under which article alſo ſeveral of the numerous localities of this ſub-ſpecies will be given.

Some varieties of granular lime-ſtone have manifeſted a conſiderable degree of flexibility; one of theſe was diſcovered by M. Fleuriau de Bellevue, at an elevation of 6000 feet, on Campo Longo, on mount Gothard. The ſame phenomenon may be artificially produced by expoſing granular lime-ſtone to a certain degree of heat.

2. *Calcareous ſpar.* *Calc ſpar*, Jam. *Kalkſpath*, Wern. *Common ſpar*, Kirw. *Spath calcaire*, Broch.

Its principal colour is white, which is pure and ſnow-white, or greyiſh, yellowiſh, greeniſh, and ſeldom reddiſh; it occurs alſo olive, aſparagus, piſtachio and leek-green; greeniſh-grey, yellowiſh-grey, honey, ochre, wine, and wax-yellow; fleſh-red, brown-red, and very rarely roſe-red; ſmoke-grey paſſing into black; very ſeldom pearl-grey, and light violet-blue.

It occurs maſſive and diſſeminated, alſo druſed and ſtalactitical, but moſt commonly cryſtallized.

The primitive figure of the cryſtals is an obtuſe rhomboid of 101° 32′ 13″, and 78° 27′ 47″, according to Haüy; and of 101° 32′, and 78° 28′, according to Bournon.

The integrant molecule, as obſerved by Monſ. de Bournon, is a trihedral priſm with inclined baſes. The number of modifications derived from the primitive rhomboid is very conſiderable; thoſe enumerated in the laſt mentioned author's very elaborate "Traité de Minéralogie," amounting to no leſs than fifty-nine.

The figures ſuppoſed fundamental by Werner, and from which all the others may be derived, are: the ſix-ſided pyramid, the ſix-ſided priſm, and the three-ſided priſm. The following Wernerian deſcription of the different varieties of calcareous ſpar is from Jameſon's Mineralogy.

1. *The ſix-ſided Priſm.*—When perfect it is acute, and three alternate lateral edges are more obtuſe than the others. It occurs 1. *Simple;* either erect or inverted. The inverted has three cylindrical concave, and three inwardly bent lateral planes, and on the upper extremity it is flatly acuminated by three planes, which are ſet on the cylindrically concave lateral planes. 2. *Double*, where the lateral planes of the one are obliquely ſet on the lateral planes of the other, in ſuch a manner, that the edges of the common baſis form a zigzag line, and the more obtuſe lateral edges of the one are oppoſed to the leſs obtuſe lateral edges of the other pyramid. Of this figure the following varieties occur: *a.* The extremity of the pyramid is ſometimes more or leſs deeply and flatly acuminated by three ſomewhat convex planes, which are ſet on the more obtuſe lateral edges? *b.* The angles of the common baſe are often more or leſs deeply truncated; when the truncating planes become ſo large that they touch one another, the tranſition into the ſix-ſided priſm is formed. *c.* The leſs obtuſe edges are ſometimes bevelled, and the extremities ſometimes more or leſs deeply truncated. *d.* If two double ſix-ſided pyramids penetrate one another in the direction of their axis, and one of them is turned around a ſixth of its periphery, ſo that the leſs obtuſe lateral edges of the one cryſtal come to be oppoſed to the leſs obtuſe lateral edges of the other, the reſult is a twin cryſtal, repreſenting a double ſix-ſided pyramid having three alternate re-entering angles at the common baſe, where the more obtuſe lateral edges are oppoſed to one another.

2. *Six-ſided Priſm.*—It occurs uſually with three alternate lateral planes broader than the others, and rather acutely acuminated by ſix planes which are ſet on the lateral edges, and the acuminating planes meet alternately under more obtuſe angles. *a.* The ſame priſm a ſecond time flatly acuminated by three planes, which are ſet on the alternate obtuſe lateral edges of the firſt acumination. *b.* When the planes of the ſecond acumination enlarge ſo much that thoſe of the firſt entirely diſappear, there reſults the ſix-ſided priſm flatly acuminated by three planes, which are ſet on the alternate and alternating lateral planes. *c.* The apex of the acumination is often more or leſs deeply truncated, which produces the ſix-ſided priſm, in which the alternate and alternating terminal angles are truncated. *d.* When the truncation of the apex becomes ſo large that all traces of the acumination diſappear, the perfect ſix-ſided priſm is formed. *e.* When the priſm becomes lower, it paſſes into the ſix-ſided table, which is often extremely thin.

3. *Three-ſided Pyramid.*—1. Simple three-ſided pyramid, whoſe ſummit angle is of various degrees of magnitude, from obtuſe to acute. 2. If the angles of the preceding figure are ſo deeply truncated, that the angles of the truncating planes meet each other, an octahedron is formed. 3. The pyramid is often double; in which caſe, the lateral planes of the one pyramid are ſet on the lateral edges of the other. It preſents the following varieties: *a.* Flat double ſix-ſided pyramid, which has ſometimes convex lateral planes. *b.* If a number of theſe flat or obtuſe pyramids are piled on one another, there is formed a ſix-ſided priſm acuminated by three planes, which are ſet on the alternate and alternating lateral planes. *c.* When this pyramid becomes very obtuſe, it gives riſe to the lens. *d.* When the ſummits of the pyramid become leſs obtuſe, and approach to right angles, a figure differing but little from the cube is formed. *e.* When

the ſummits become ſtill more acute, an acute double three-ſided pyramid is formed. *f.* The acute double three-ſided pyramid is ſometimes truncated on the lateral edges, ſometimes bevelled: in the latter caſe, when the bevelling planes become ſo large that the original ones are very ſmall, or even diſappear, the reſult is an acute double three-ſided pyramid, having its planes length-wiſe divided; or it is a double ſix-ſided pyramid. *g.* If the ſummits of the double ſix-ſided pyramid are deeply truncated, it gives riſe to the ſix-ſided table, having its terminal planes ſet on alternately in oppoſite directions.

Though the preceding deſcription of the different modifications of calcareous ſpar may poſſeſs the merit of ſpeaking to the eye, yet it can by no means ſuperſede the details of a ſtrictly cryſtallographical inveſtigation; we therefore ſubjoin a ſhort abſtract of the excellent claſſification given by count Bournon, in the firſt volume of his "Traité de Minéralogie" lately publiſhed.

All the modifications of cryſtallized carbonate of lime are by this author divided into, 1, priſmatic; 2, rhomboidal; and 3, pyramidal modifications.

I. *Priſmatic Modifications.*

1. *Priſm from the edges of the baſe of the primitive cryſtal;* or theſe edges intercepted each by a plane.—Of this, a variety with very ſhort priſm occurs in Cumberland and Derbyſhire. That with long priſm (Chaux carbon. *priſmé*, Haüy, pl. 24. f. 10) is likewiſe found in Cumberland. The variety in which the lateral planes form rhombs, ſo that the cryſtal at firſt ſight has the appearance of the garnet dodecahedron, is the ſcarceſt of this modification.

2. *Priſm from the ſolid angles of the baſe;* theſe angles of the primitive cryſtal being intercepted each by a plane.—The chaux carb. *imitable*, Haüy, (ib. fig. 12.) belongs to this modification. It is generally ſeen in combination with others. Sometimes two of the planes of the pyramid of the primitive rhomboid enlarge at the expence of the third; and ſometimes one of them cauſes, in the ſame manner, the two others to diſappear. Found in Cumberland, Dauphiné, and on the Hartz.

3. *Summit intercepted by a plane perpendicular to the axis.*—This modification ſeldom occurs in its ſimple ſtate. The varieties in which this plane is of conſiderable extent is called chaux carb. *baſée* by Haüy (pl. 23. fig. 8.) This is frequently ſeen united with the preceding modifications; in which caſe, if the new plane has cauſed the pyramid of the rhomboid entirely to diſappear, the chaux carb. *priſmatique*, Haüy, (pl. 24. fig. 14.) is produced, the fineſt groups of which are found in Cumberland and on the Hartz. Some of the lateral planes of theſe priſms frequently enlarge, at the expence of the adjoining planes; ſo that one, two, or even three, entirely diſappear. The cryſtals of the regular hexahedral priſmatic variety, from the Hartz, are not unfrequently ſeen with white opaque ſurface, and alſo ſometimes to include ſimilar cryſtals of ſmaller diameter, which now and then project above the terminal plane of the larger cryſtal. The priſm of this variety is often ſo ſhort as to repreſent a thin ſix-ſided table. When both the ſecond and the firſt modifications are united in the priſm, we have the chaux carb. *péridodécaèdre* of Haüy (pl. 26. fig. 33.)

II. *Rhomboidal Modifications.*

A. *Obtuſe Rhomboids.* Of theſe, Nos. 5, 6. 8, and 9, have not before been noticed.

4. *Obtuſe rhomboid of* 114° 19', *and* 65° 41'.—One of the moſt common modifications, and more frequently than all the reſt (except the preceding) combined with other modifications. It is produced by the edges of the pyramids of the primitive rhomboid being replaced each by a plane equally inclining on thoſe by which the edge itſelf is formed. In its complete ſtate, this modification is the chaux carb. *équiaxe* of Haüy (pl. 23. fig. 2.), which is much more frequently met with than the different paſſages of the primitive rhomboid into this modification. The planes of this fourth modification are often longitudinally ſtriated; and when they are arrived at their limits, the ſtriæ run parallel to the ſhorter diagonal of the rhomboidal planes.—This is found united principally with No. 2, repreſenting various degrees of elongation of the chaux carb. *dodécaèdre*, Haüy (pl. 24. fig. 18.): found alſo as twin cryſtals in Derbyſhire; with No. 1, belonging to the chaux carb. *biſunitaire*, Haüy (fig. 17.), chiefly from Cumberland (rare); with Nos. 1 and 2, and with Nos. 2 and 3, chaux carb. *équivalente*, Haüy (pl. 25. fig. 28.), both from Cumberland; with Nos. 2 and 3, and part of the primitive planes, whence it is called chaux carb. *triforme* by Haüy (fig. 26.). The laſt mentioned variety is from the Hartz; and both the ſpecimen of Haüy and that deſcribed by M. de Bournon are remarkable, for having part of the pyramid covered with cryſtalline matter, which appears to be depoſited after the cryſtal had been completed, and is thus forming a paſſage into the regular hexahedral priſm.

5. *Very obtuſe rhomboid of* 117° 56', *and* 62° 4'.—It is produced by the edges of the primitive rhomboid being replaced each by a plane, which is inclined towards its ſummit. This has hitherto been found only in combination with other modifications, *viz.* Nos. 2 and 3. The cryſtals are all from the Hartz, where red ſilver ore is ſometimes accompanied with them. The variety of calcareous ſpar, called *en roſe*, generally belongs to the complete rhomboid of this modification, as alſo moſt of thoſe known by the names of coxcomb and lenticular ſpar; but they are ſeldom determinable by the goniometer.

6. *Obtuſe rhomboid of* 113° *and* 67°.—This is eaſily confounded with the preceding modification. Count Bournon has obſerved it only in a few inſtances, combined with the planes of Nos. 1, 2, and 36 (*vide infra*), in cryſtals from Derbyſhire and Cumberland.

7. *Obtuſe rhomboid of* 107° 3', *and* 72° 57'.—This is the reſult of a decrement of the laminæ, ſimilar to that which produces the preceding modification; but the planes thus formed are more inclined on the baſe of the primitive rhomboid. To this is to be referred Haüy's chaux carb. *quadrirhomboïdale.* (Ann. du Muſ. d'H. Nat. t. 1. pl. 8. fig. 4.) It is always obſerved in combination with other modifications, ſuch as with thoſe of Nos. 1, 2, and with thoſe of the primitive cryſtal. They come from Dauphiné and Derbyſhire. This modification has not yet been ſeen perfect; though nearly ſo, in a variety which has very narrow planes of No. 1. One variety from Derbyſhire, which has the priſm of No. 2 combined with this modification, and part of the planes of the primitive rhomboid, might be eaſily miſtaken for priſmatic rock cryſtal, of which it has ſometimes the tranſparency. The planes marked *l* in Haüy's chaux carb. *rétrograde*, (pl. 26. fig. 36.) belong to this variety.

8. *Very obtuſe rhomboid of* 118° 34', *and* 61° 26'.—This moſt obtuſe of all rhomboids known to occur in calcareous ſpar, is the reſult of a decrement of the cryſtalline laminæ, at the obtuſe angles of the planes that form the ſolid angle of the ſummit, which is thus replaced by three planes reſting on thoſe of the primitive rhomboid. This modification, which is ſcarce, does not occur in its complete ſtate: beſides with planes of the primitive rhomboid, it has been obſerved

in combination with thoſe of Nos. 1, 3, 5, 8, 41, and 43; moſt of them from the Hartz. Perhaps ſome of the very flat lenticular varieties of calcareous ſpar may be alſo referable to this modification.

9. *Slightly obtuſe rhomboid of* 95° 28′, *and* 84° 32′.—This very rare modification is produced by the obtuſe angles on the baſe of the primitive rhomboid being replaced, each by a plane reſting on the correſponding primitive planes. It is obvious, that the cleavage of this rhomboid muſt be different from that of the laſt mentioned modification, by being on the planes of the ſummit inſtead of the baſe; while that of all the preceding rhomboids, likewiſe at the baſe, takes place on the edges. This rhomboid has been obſerved perfect in ſpecimens from Siberia; and in combination with the planes of No. 36.

B. *Acute rhomboids.* Nos. 10, 12, 15, 16 and 18—21 of this diviſion are new.

10. *Acute rhomboid of* 65° 28′, *and* 114° 32′.—The obtuſe angles of the primitive rhomboid replaced each by a plane, as in the preceding; but being the reſult of a more rapid decrement of the laminæ, its axis is three times longer than that of the primitive rhomboid. Occurs, though rarely, in Derbyſhire, both in its complete ſtate, and in combination with remains of the planes of No. 2.

11. *Acute rhomboid of* 45° 34′, *and* 134° 26′.—The reſult of a decrement on the ſame angles as in the preceding, but the decrement producing a rhomboid much more acute. It is the chaux carb. *contraſtante* of Haüy (pl. 23. fig. 5.) one of the moſt common rhomboids that occur in calcareous ſpar. It occurs perfect, ſometimes with traces of the primitive planes, and in combination with Nos. 1, 2, 3, 4, and 36. Is found in Derbyſhire, Cumberland, at Grenoble in France, on the Hartz, &c. When the planes of the rhomboid of this modification are combined with thoſe of the common acute pyramidial dodecahedron, No. 36, they replace the ſolid angles of the baſe of this dodecahedron in the form of an elongated trapezoid.

12. *Acute rhomboid of* 40° 26′, *and* 139° 34′.—Decrement on the ſame angles as in the preceding, to which it approaches cloſely. Occurs moſtly in its complete ſtate in Derbyſhire, and has been ſeen combined in the ſame cryſtal with planes of the primitive rhomboid, and Nos. 1, 14, and 36, in which latter its planes are placed nearly in the ſame manner as thoſe of the rhomboid of the preceding modification.

13. *Very acute rhomboid of* 15° *and* 165°.—Decrement on the ſame angles as in the preceding modifications, but giving origin to a much more acute rhomboid. Count Bournon has obſerved it in its complete ſtate. It is ſeldom ſeen, and it is difficult to preſerve it, on account of the great fragility of the fine termination of the cryſtals. Combinations of the planes of this and No. 4 occur in Derbyſhire, on the Hartz, &c. and in Cumberland, generally on cryſtals of ſulphate of barytes; the one called chaux carb. *contractée* (Haüy, pl. 24. fig. 20.) belongs to it. Fine groups of this modification in its complete ſtate have been found in Weſtmoreland; and in the ſame ſpecimen, combined with planes of the very acute pyramidal dodecahedron, No. 54.

14 *Slightly acute rhomboid of* 87° 42′, *and* 92° 18′.—This is the chaux carb. *cuboïde* of Hauy, (pl. 23. fig. 7.) It occurs complete, with planes of the primitive rhomboid, and combined with the planes of ſeveral other modifications, ſuch as Nos. 1—4, and No. 15, in Languedoc, at Strontian, Bath, in Derbyſhire, and on the Hartz. This modification, combined with the planes of No. 3, is the chaux carb. *apophane* of Haüy, (pl. 24. fig. 15.)

15. *Acute rhomboid of* 84° 26′, *and* 95° 34′.—This rhomboid, the preceding, and all the following, are the reſult of a decrement of the cryſtalline laminæ on the obtuſe angles of the baſe; and the cleavage in all of them takes place at the ſummit, and on the edges of the cryſtal. Though combined with moſt of the other modifications, the planes of this rhomboid have never been mentioned by cryſtallographers, a circumſtance probably owing to their ſmallneſs, and their having been confounded with the preceding, from which it is, however, eaſily diſtinguiſhed, even without the aſſiſtance of the goniometer. It is ſometimes found in a complete ſtate on the Hartz, and at Strontian in groups, accompanied with ſtilbite and croſs-ſtone, or harmotome; and in combination with the planes of Nos. 1—5. and alſo with the remains of thoſe of the primitive rhomboid.

16. *Acute rhomboid of* 81° 19′, *and* 98° 41′.—This is oftener ſeen in its complete ſtate than combined with the planes of other modifications, ſuch as thoſe of Nos. 1, 2, 3, 4, and 36; it alſo occurs with traces of the primitive rhomboid. Moſt of theſe were brought from the iſland of Ferroe, and from Scotland; the former moſtly in groups, with ſtilbite zeolite, the others with analcime zeolite. The variety in which it is combined with No. 4, came from Caſtagna-moro, in Italy. Their gangue, in the above places, is a wacke like rock.

17. *Acute rhomboid of* 75° 31′, *and* 104° 29′.—This is the chaux carb. *inverſe* (Haüy, pl. 23. fig. 3.), ſo called becauſe this rhomboid is, as it were, an inverſion of the primitive. Next to No. 14, it is the moſt common of all the modifications of calcareous ſpar; but a circumſtance worth remarking is, that it ſcarcely ever occurs in any other but ſhell lime-ſtone; while the reverſe prevails with regard to the primitive rhomboid which, in its perfect ſtate, is ſeldom found in any but the older formations of lime-ſtone. The name of *muriatique*, given to this rhomboid by Romé de l'Iſle, is derived from the juſt mentioned mode of occuring. The complete rhomboid frequently occurs in veins at Bath, in Derbyſhire, and lining hollows of ſhell-marble in ſeveral other parts of Britain. In ſtill greater perfection it is found, together with various combinations of the planes of other modifications, in the ſhell lime-ſtone of Couſon, near Lyons, and in thoſe of Vougy, near Roanne, in Forez; in the former of theſe places it is generally ſeen in the interior of ſiliceo-calcareous geodes; in the latter in geodes of black, earthy, and compact black manganeſe, with mammillary internal ſurface. It has been obſerved by M. de Bournon combined with the planes of the primitive rhomboid, and with thoſe of Nos. 1 to 4, and Nos. 11, 14, 36, 37, and 49. That with narrow remains of the primitive planes is Haüy's chaux carb. *unitaire* (pl. 23. fig. 9.); that with remains of the primitive planes, and thoſe of the priſm No. 2, has been deſcribed by the ſame cryſtallographer under the name of chaux carb. *unibinaire* (Ann. du Muſ. Par. vol. i.); that with the planes of the ſame priſm No. 2, and with thoſe of No. 3, is Haüy's chaux carb. *perſiſtante* (pl. 25. fig. 29.); the ſame with additional remains of the planes of No. 4, is his chaux carb. *coordonnée*; and a variety in which this rhomboid is combined with narrow planes of Nos. 1, 2, 3, 4, and 37, is deſcribed by him under the name of chaux carb. *quadruplante*. (Ann. du Muſ. vol. i.)

18. *Acute rhomboid of* 70° 18′, *and* 109° 42′.—This rhomboid is very rare, and has been ſeen in combination only with the planes of the priſm No. 2, accompanied by planes of Nos. 23, 30, 36, and of the primitive rhomboid. Theſe cryſtals occur in Cumberland and in Derbyſhire.

19. *Acute rhomboid of* 61 12′, *and* 118 48′. This has been obſerved by count Bournon, in its complete ſtate, in a

maſs of brown iron-ſtone; and alſo in combination with the planes of the primitive rhomboid and thoſe of Nos. 1, 2, 3, 4, 11, and 36. The cryſtals exhibiting this modification are, with a few exceptions, all from Derbyſhire.

20. *Acute rhomboid of* 55° 34', *and* 124° 26'.—This rhomboid, which has been obſerved complete, and in combination remains of the primitive planes, and thoſe of Nos. 2 and 3, is of ſtill rarer occurrence than the preceding. Found in Derbyſhire and Cumberland. The preceding, and the next modification, ſometimes exhibit, underneath their pyramidal edges, the planes of the primitive rhomboid, which, eſpecially when of a different tint from the reſt, are viſible through the ſubſtance of the cryſtal; a phenomenon produced by a ſuperpoſition of cryſtalline matter on the cryſtal already formed.

21. *Acute rhomboid of* 50° 54', *and* 129° 6'.—This occurs both ſimple and combined with other modifications, ſuch as Nos. 1, 2, 3, 4, 11, 17, and 46, in the Hartz, in Cumberland, and more frequently in Derbyſhire. It is often ſeen to accompany ſtalactitical varieties of calcareous ſpar.

22. *Very acute rhomboid of* 37° 31', *and* 142° 29'—This is the chaux carb. *mixte* of Haüy (pl. 23. fig. 6.) It is, like the preceding, not unfrequently met with, particularly as accompanying ſtalactitical lime-ſtone; it occurs as often in a complete ſtate as combined with the planes of other modifications, among which are Nos. 2, 3, 4, 7, 11, 14, and 46. They are principally found in Derbyſhire. The variety which is combined with the planes of No 4, has been deſcribed by Haüy under the name of *unimixte* (Ann. du Muſ. vol. i.); and that with the planes of No 11, and remains of the primitive planes, is called by the ſame cryſtallographer chaux carb. *tri-rhomboidale* (Min. pl. 25. fig. 17.); that with additional traces of the planes of No. 7, is his chaux carb. *quadri-rhomboidale* (Ann. du Muſ. vol. i.). When the planes of this variety, and thoſe of Nos. 11 and 3, are united at the extremities of the priſmatic modification No. 2, it is Haüy's chaux carb. *annulaire* (ibid.)

23. *Extremely acute rhomboid of* 14° 6', *and* 165° 54'.—This is the moſt acute of all the rhomboids that belong to calcareous ſpar. It is ſeldom ſeen in its complete ſtate, both on account of its minuteneſs and its extreme fragility; M. de Bournon has, however, obſerved it ſeveral times on the groups of calcareous ſpar from the Hartz, which are conſidered as filiform and indeterminable. The combination of the planes of this with thoſe of No. 4, is named chaux carb. *dilatée* by Haüy (pl. 24. fig. 21.), which occurs alſo as macle; that with traces of the planes of Nos. 3 and 17 is the ſame cryſtallographer's chaux carb. *hyperoxide* (pl. 25. fig. 30.); and that with Nos. 4 and 7, his chaux carb. *rétrograde* (pl. 26. fig. 36.) It occurs alſo with the planes of ſeveral other modifications. This rhomboid might eaſily be miſtaken for that of No. 13, which is, however, the reſult of quite a different decrement of the cryſtalline laminæ, and conſequently has a different cleavage.

III. *Pyramidal Modifications.*

The ſeveral pyramidal dodecahedrous belonging to this diviſion, are here diſtinguiſhed from each other by the meaſure of the ſolid angle of their ſummit, taken on two oppoſite edges of the pyramid.

A. *Pyramidal obtuſe dodecahedrons.*—The modifications of this ſub-diviſion of pyramidal dodecahedrons are, upon the whole, very rare, and almoſt peculiar to England, where they occur in Derbyſhire, Cumberland, and Durham. When the planes of ſeveral of thoſe modifications are combined in the ſame cryſtal, their narrowneſs, together with the very obtuſe angles they form with one another, ſometimes produces curvilinear planes, eſpecially when they are, at the ſame time, combined with the planes of ſeveral of the rhomboidal modifications.

The following ten modifications, with the exception of Nos. 27 and 30, have not been noticed before.

24 *Obtuſe pyramidal dodecahedron of* 134° 28'.—This modification (as well as thoſe that follow), is the reſult of a retrogradation of the cryſtalline laminæ, along, and parallel with, the edges of the pyramids of the primitive rhomboid, replacing each of theſe edges by a double plane or bevelment. Three of the edges in each pyramid of this modification muſt, therefore, be exactly in the ſame direction with thoſe of the primitive rhomboid. It has not been obſerved either in its paſſage from the primitive rhomboid, or as complete dodecahedron, but only in combination with very ſhort planes of the priſm No. 2 (from Cumberland); with thoſe of Nos. 2, 4, and 36, in a pyramidal cryſtal from Derbyſhire; and with thoſe of Nos. 2 and 35, from the ſame county.

25. *Obtuſe pyramidal dodecahedron of* 126° 51'.—This modification, if it exiſted in a complete ſtate, would exhibit pyramids with planes forming iſoſceles triangles, and conſequently with all the angles of the common baſe on the ſame level. M. de Bournon has but twice obſerved this modification; and in both caſes combined with the planes of ſeveral other modifications, among which thoſe of the priſm No. 2 are the moſt apparent. From Derbyſhire.

26. *Obtuſe pyramidal dodecahedron of* 124° 36'.—This is of much more frequent occurrence than the preceding, from which it differs eſſentially, in having ſcalene triangles. The complete dodecahedron comes from Derbyſhire; a combination of its planes with thoſe of No. 2 from Cumberland. In Derbyſhire it is alſo found combined with the planes of ſeveral other modifications, of which thoſe of Nos. 2 and 36 are the moſt characteriſtic.

27. *Obtuſe pyramidal dodecahedron of* 121° 26'.—The planes that terminate Haüy's chaux carb. *ſonſtractive* (pl. 26. fig. 37.) belong to this modification. They are alſo ſeen in his chaux carb. *ſurcompoſée* (pl. 28. fig. 50.), in which five modifications are combined. Cryſtals with planes of this dodecahedron are common in Derbyſhire and Cumberland, where it occurs combined with the planes of ſeveral other modifications. The complete dodecahedron is ſcarce.

28. *Obtuſe pyramidal dodecahedron of* 118° 26'.—Has not yet been found in a complete ſtate. The ſimpleſt combination is that with the very ſhort planes of the priſmatic modification No. 2. But it generally occurs together with the planes of ſeveral other modifications, ſuch as with Nos. 4, 7, 11, 27, 28, and 36, and in ſome of theſe alſo, with remains of the planes of the primitive rhomboid. Found principally in Derbyſhire and Cumberland.

29. *Obtuſe pyramidal dodecahedron of* 117° 25'.—Differs but little from the preceding. It has not been found in a complete ſtate, nor are its planes often ſeen combined with thoſe of other modifications; among thoſe figured by M. de Bournon are Nos. 2, 15, 17, and 36. The cryſtals which exhibit its planes are moſtly from Derbyſhire.

30. *Obtuſe pyramidal dodecahedron of* 115° 17'.—Its planes are repreſented in Haüy's chaux carb. *disjointe* (pl. 26, fig. 38.), in which it is combined with thoſe of Nos. 2 and 36. In the ſame author's chaux carb. *binoſenaire* (Ann. du Muſ. vol. i.) it is ſeen without the planes of the priſmatic modif. No. 2, but with thoſe of No. 36; and his chaux carb. *additive* (ibid.) is the biſonaire, augmented by the planes of No. 4. Theſe cryſtals are ſaid to come from Derbyſhire. M. de Bournon has not himſelf ſeen cryſtals with planes of this modification.

31. *Obtuſe, pyramidal dodecahedron of* 100° 24′.—The planes produced by the retrogradation of the cryſtalline laminæ replace the edges of the primitive rhomboid, but inſtead of being parallel to them, as in the preceding modifications, they become narrower towards the ſummit of the rhomboid. The two pyramids of this dodecahedron are, like thoſe of No. 25, compoſed of iſoſceles triangles, whence the angles of their baſe muſt be upon a level. It has not yet been obſerved in its complete ſtate; but in a variety compoſed of its planes and thoſe of Nos. 35 and 2, M. de Bournon has ſeen it terminate the cryſtal in a very regular manner. It has alſo been obſerved in a cryſtal in which the planes of No. 2, and in another in which thoſe of No. 36. are predominant. The cryſtals exhibiting the planes of this modification are rare, and have been found only in Derbyſhire and Cumberland.

32. *Obtuſe pyramidal dodecahedron of* 101° 6′.—This has not been ſeen complete, but in combination with the planes of ſeveral other modifications producing very complicated cryſtals. They occur in Derbyſhire, but rarely. The cleavage of this dodecahedron takes place at the baſe on the leſs obtuſe edges.

33. *Obtuſe pyramidal dodecahedron of* 95°.—The cryſtals in which are ſeen the planes of this modification occur but ſeldom, and are ſtill more complicated than thoſe with the planes of the preceding modification. One of the two cryſtals figured by M. de Bournon comprehends 72, and the other no leſs than 84 planes, of which thoſe of the priſmatic modification, No. 2, are the principal ones. They were found in Derbyſhire. The cleavage of this dodecahedron is the ſame as that of the preceding modification.

B. *Acute pyramidal dodecahedrons.*—The following modifications, with the exception of Nos. 34, 36, 39. 48* and 50, are all new.

34. *Acute pyramidal dodecahedron of* 88° 53′.—The planes of this dodecahedron are the reſult of a decrement of the cryſtalline laminæ along the edges of the baſe of the primitive rhomboid: cleavage at the ſummit on the more obtuſe edges. Theſe planes are marked *v* in Haüy' figure of his chaux carb. *bigéminée* (pl. 27. fig. 49.) Beſides in this combination, (in which the planes of No. 36. are the moſt prominent,) M. de Bournon has obſerved them with the planes of Nos. 2, 29, and 34, in two cryſtals from Cumberland, where alſo the complete dodecahedron has been found. The planes of this modification are of rare occurrence.

35. *Acute dodecahedral pyramid of* 78° 40′.—This is far leſs ſcarce than the preceding modification, with which it agrees in the nature of the decrement and the cleavage. Has not yet been obſerved in its complete ſtate. Its planes are repreſented in Haüy's figure of chaux carb. *aſcendante* (pl. 27. fig. 44. *n*), in which they are combined with thoſe of Nos. 2 and 11. Another cryſtal has been deſcribed by Haüy, under the name of *ſouſquadruple* (Ann. du Muſ. vol. ii.), which differs from the latter in having alſo traces of No. 28. The dodecahedron has not been ſeen in its complete ſtate, but our author poſſeſſes cryſtals in which the two pyramids are ſeparated from one another only by ſhort planes of the priſmatic modification No. 2. Beſides this, its planes have been obſerved in combination with ſome other modifications. Theſe cryſtals have been found in Derbyſhire.

36. *Acute pyramidal dodecahedron of* 48° 22′.—This is Haüy's chaux carb. *métaſtatique* (pl. 40, fig. 70), a modification which, both in its complete ſtate, and in conjunction with the planes of other modifications, is of moſt frequent occurrence in the cryſtals of calcareous ſpar. We ſhall mention the more intereſting varieties.

When, in the progreſs from the primitive rhomboid into this dodecahedron, only ſmall planes of the former remain at the top of the pyramid, it is the chaux carb. *binaire* of Haüy (pl. 24. fig. 11.) The complete dodecahedron is ſtill more common than this; it is ſometimes found with planes of the pyramids unequal, and not meeting in a point; alſo as macle. Combined with ſmall planes of No. 2, it is Haüy's chaux carb. *biſalterne* (pl. 25. fig. 23); which likewiſe occurs as macle. When the planes of the priſmatic variety are more conſiderable than in the juſt-mentioned variety, and, conſequently, hexagonal, it is the chaux carb. *priſmée* of Haüy (pl. 25. fig. 24.); this is very common. If, in addition to the latter, ſmall planes of No. 4. are ſeen, it is the chaux carb. *analogique priſmée* of Haüy (pl. 26. fig. 35.); from which the chaux carb. *analogique disjointe* (Haüy, pl. 26. fig. 38.) only differs in the magnitude of the planes of Nos. 4 and 36. The combination of Nos. 2, 4, and 36, is alſo ſometimes ſeen in the ſhape of that beautiful macle called "heart-ſhaped calcareous ſpar," and explained and figured by M. de Bournon. The priſm of No. 2, having planes of this 36th modification, together with remains of the primitive planes at the ſummits of the pyramid, is Haüy's chaux carb. *bilinaire* (pl. 25. fig. 26.) In combination with the priſm of No. 1, and with Nos. 1 and 37, this dodecahedron is ſeldom found; in the latter the line which ſeparates the pyramidal planes from the priſm is ſometimes imperceptible, ſo that the cryſtal appears compoſed of curvilinear planes.

A variety, remarkable on account of its ſimplicity, is the chaux carb. *analogique* (Haüy pl. 26. fig. 34.); it is likewiſe compoſed of the planes of this modification, and thoſe of Nos. 2 and 4, forming altogether a cryſtal of 24 trapezoidal planes, not unlike thoſe of the leucite, except that in the former the planes are of three different dimenſions.

This modification is alſo often ſeen in combination with the planes of No. 11; the variety in which theſe latter have much increaſed in ſize at the expence of the former, is Haüy's chaux carb. *binoternaire* (pl. 25. fig. 25.); the ſame cryſtal is alſo obſerved as macle. A ſimilar variety, but which contains alſo narrow planes of Nos. 4 and 17, is the chaux carb. *doublante* of the ſame cryſtallographer, (pl. 27. fig. 47.)

The pyramidal variety of this modification with planes of Nos. 17 and 11, is Haüy's chaux carb. *progreſſive* (pl. 27. fig. 41.); and a ſimilar one, but with the planes of No. 2 inſtead of 11, is the ſame author's chaux carb. *emouſſée* (pl. 26. fig. 40.); the latter occurs alſo as macle.

Many more combinations of the planes of this modification, with thoſe of others, are deſcribed and figured by count Bournon; among others a cryſtal, compoſed of ſeven modifications, contains, in all, ſixty planes, and another, compoſed of eleven modifications, exhibits no leſs than 96 planes. The ſame author has illuſtrated this modification by 129 figures.

37. *Acute pyramidal dodecahedron of* 40° 14′.—Though the dodecahedron of this modification is conſiderably more acute than that of the preceding modification; yet it appears to have hitherto been confounded with it. It has been found in combination with the planes of the primitive rhomboid, and thoſe of Nos. 36, 2, and 11, and alſo in its complete ſtate. The cryſtals exhibiting this modification are pretty large. They have been found only in the Dauphiné Alps of Loiſan, and in Derbyſhire.

38. *Pyramidal dodecahedron of* 37° 5′.—This might eaſily be miſtaken for the dodecahedron of the preceding modification. It has not yet been obſerved in its complete ſtate, but

in combination with the planes of Nos. 2, 3, 15, 17, 22, and with remains of the planes of the primitive rhomboid. Has been found in Hungary, and other places; but does not appear to occur in England.

39. *Pyramidal dodecahedron of* 29° 58'.—The complete dodecahedron occurs in Germany; nearly complete, with planes of No. 17 at the points of the pyramids, it is Haüy's chaux carb. *ſexduodécimale* (pl. 25. fig. 22.); with the ſummit intercepted by N° 3, and with trapezoidal planes of No. 2, it conſtitutes the ſame cryſtallographer's chaux carb. *octodécimale* (ib. fig. 31.); its planes are alſo ſeen in his chaux carb. *zonaire* (pl. 26. fig. 39.) in combination with thoſe of No. 1, and of No. 17, which latter are the characteriſtic planes. Alſo the variety deſcribed by Haüy under the name of *quintiforme*, (Ann. du Muſ. vol. ii.) has ſmall planes of this 39th modification, which has hitherto been found principally in Germany.

40. *Acute pyramidal dodecahedron of* 26° 34'.—This dodecahedron is not unfrequently ſeen in its complete ſtate, but its points, on account of their great fragility, are generally broken. It occurs in Germany, from which country, and from Derbyſhire and Cumberland, are alſo procured groups of cryſtals, including the planes of this modification, in combination with others, ſuch as Nos. 1, 2, 3, 17, 19, 21, 22, 39, and 50.

41. *Acute pyramidal dodecahedron of* 15° 53'.—This is the laſt, and at the ſame time the moſt acute, of the ſeries of pyramidal dodecahedrons produced by a decrement along the edges of the baſe of the primitive rhomboid, and conſequently with cleavage at the ſummit on the more obtuſe edges of the pyramid. This dodecahedron occurs complete, but, on account of its great fragility, is generally ſeen in a broken ſtate; ſometimes two oppoſite planes of the pyramid, having increaſed in ſize, ſo that they meet no longer in a point, give riſe to cuneiform pyramids. Nor is it uncommon to ſee four oppoſite planes in the ſame caſe. Such cryſtals bear great reſemblance to certain varieties of arragonite, from which they are, however, eaſily diſtinguiſhed by their much greater fragility, and by their lamellar ſtructure. It has been obſerved with veſtiges of the primitive planes, and in combination with thoſe of ſeveral other modifications: in one cryſtal there are no leſs than 60 planes, being the reſult of ſeven different modifications. The cryſtals exhibiting planes of this modification are moſtly found in Cumberland, Derbyſhire, and on the Hartz.

42. *Acute pyramidal dodecahedron of* 67° 55'.—With this begins the ſeries of thoſe dodecahedrons which are the reſult of a decrement of the laminæ at the acute angles, on the baſe of the primitive rhomboid. Hence the cleavage takes place at the ſummit on the leſs obtuſe edges. Is found in its complete ſtate, and combined with the planes of Nos. 36, and 36 and 2, in Derbyſhire; but belongs to the more ſcarce modifications of calcareous ſpar.

43. *Acute dodecahedral pyramid of* 62° 36'.—This has been found in a complete ſtate in Derbyſhire, where, as well as in Cumberland, it occurs alſo combined with the planes of ſeveral other modifications, forming, in ſome inſtances, very complicated cryſtals, ſuch as that of fig. 476 in the work before us, the 102 planes of which are the reſult of eleven modifications.

44. *Acute dodecahedral pyramid of* 61° 47'.—Though the ſolid angle of the ſummit of this dodecahedron differs but little from that of the preceding modification, yet there is a great difference in the inclination of their planes: in the preceding dodecahedron theſe meet each other under three angles of 158° 22', and three others of 96° 40', while in this 44th modification they meet three of them under an angle of 140° 42', and three under one of 112° 44'. The complete dodecahedron of this modification is ſcarce, but occurs in Derbyſhire. In combination with the planes of other modifications, particularly with Nos. 2 and 14; 2, 14, and 47; 2, 4, and 50, it is found in Derbyſhire and Cumberland; and combined with planes of ſeveral other modifications, count Bournon has ſeen it among the cryſtals of calcareous ſpar that accompany the ſilver ores of Potoſi; one of theſe cryſtals, the reſult of eight modifications, has 66 planes.

Haüy's chaux carb. *numérique* (I. des Min. No. 106.) approaches very near this modification in the meaſurement of its angles.

45. *Acute pyramidal dodecahedron of* 56° 30'.—Might eaſily be miſtaken for the dodecahedron, No. 36, in which, however, the cleavage takes place on the more obtuſe edges. The dodecahedron in its complete ſtate has been found in Derbyſhire, where this modification occurs in combination with the planes of ſeveral others; the moſt complicated among them is a cryſtal, produced by ten modifications, five of which belong to rhomboids, and four to dodecahedrons, which, together with the planes of the priſm No. 2, form a cryſtal of 84 planes.

46. *Acute pyramidal dodecahedron of* 49° 23'.—Reſembles the dodecahedron, No. 43, with regard to the inclination of its planes to each other; but it is much more acute. On the other hand it approaches near the dodecahedron, No. 36, in the meaſurement of the ſolid angle of its ſummit; but in this the inclination of the planes is different, not to mention the difference in the cleavage. This dodecahedron in its complete ſtate is very ſcarce, it has, however, been found in Derbyſhire and Cumberland; the combinations of its planes with thoſe of other modifications, ſuch as Nos. 1, 2, 3, 4, 6, 17, 36, and thoſe of the primitive rhomboid, are more frequently met with in thoſe parts of England.

47. *Acute pyramidal dodecahedron of* 45° 2'.—This appears to be peculiar to the ſame places, in which the cryſtals with the planes of the preceding modification are found. The complete dodecahedron is ſeldom ſeen. It is moſt frequently found in combination with the priſm No. 2: the angles of three alternate edges being very obtuſe, its pyramid appears almoſt triangular. Theſe cryſtals are in general very tranſparent and beautiful.

48. *Acute pyramidal dodecahedron of* 44° 30'.—This is but little more acute than the dodecahedron of the preceding modification; but the planes of the latter meet each other, three under an angle of 163° 50', and three under one of 84°; while in this 48th modification the ſame planes meet three under 150° 8', and three under 97° 12'. The dodecahedron in its complete ſtate has not yet been found. Its planes occur in cryſtals from Cumberland and Derbyſhire, in combination with thoſe of Nos. 2, 14, 32, 36, and 45.

48*. *Acute pyramidal dodecahedron of* 41° 31'.—The planes of this modification are thoſe marked *x* in the figures of Haüy's chaux carb. *paradoxale* (pl. 27. fig. 42.), *deloſique* (ib. fig. 46.), and *complexe* (ib. fig. 43.)

49. *Acute pyramidal dodecahedron of* 39° 9'.—The dodecahedron of this modification in its complete ſtate is from Hungary. Combined with the planes of ſeveral other modifications, it occurs principally in Derbyſhire; one of the cryſtals from thence, figured by count Bournon, is compoſed of 90 planes, being the reſult of nine modifications.

50. *Acute pyramidal dodecahedron of* 25° 25'.—To this probably belong the pyramidal planes of Haüy's chaux carb. *acutangle*. This modification has hitherto been principally found on the Hartz, it occurs however alſo, combined with the planes of ſeveral others, in Derbyſhire and other parts

of England; the cryſtals that exhibit its planes frequently accompany ſtalactitical carbonate of lime. The complete dodecahedron has not yet been found.

51. *Acute pyramidal dodecahedron of* 14° 30′.—The planes of the very acute pyramids of this modification are of rare occurrence; and in its complete ſtate the dodecahedron has not been ſeen at all. The cryſtals from Derbyſhire, on which its planes have been obſerved, are the reſults, ſome of ſix, others of ſeven and eleven, different modifications.

52. *Acute pyramidal dodecahedron of* 18° 26′.—Though this and the two following dodecahedrons are, like thoſe of the preceding modifications, the reſult of an intermediate decrement of the cryſtalline laminæ on the acute angles of the planes at the baſe of the primitive rhomboid, yet they differ from the latter in the cleavage, which takes place on their more obtuſe edges. This dodecahedron has not yet been found in its complete ſtate; in combination with the planes of ſeveral other modifications, of which thoſe of No. 36 are the moſt conſiderable, it is found in Derbyſhire.

53. *Acute pyramidal dodecahedron of* 16 35′.—M. de Bournon has obſerved the planes of this modification only in two cryſtals from Saxony, where they ſometimes accompany red ſilver ore. This is undoubtedly the ſcarceſt of all modifications of calcareous ſpar, and one of the few that are not found in England.

54. *Acute pyramidal dodecahedron of* 14° 4′.—This is the moſt acute of all dodecahedrons hitherto obſerved in calcareous ſpar. It differs but little in this reſpect from that of No. 51; but independently of the conſiderable difference in the reſpective inclination of their planes to each other, the cleavage of the former is on the leſs obtuſe edges, while that of this modification takes place on the moſt obtuſe edges. M. de Bournon has obſerved the planes of this modification in two varieties only; the one is the dodecahedron in its complete ſtate; the other exhibits its planes combined with thoſe of No. 13, which latter happens to be the moſt acute of all rhomboids hitherto obſerved of this ſubſtance. Both varieties were found in Weſtmoreland.

55. *Acute pyramidal dodecahedron of* 34° 12′.—This dodecahedron, like thoſe of Nos. 25 and 31, is compoſed of iſoſceles triangles. Count Bournon has obſerved this rare modification in a few cryſtals from Derbyſhire, in combination with the planes of the primitive rhomboid, and thoſe of Nos. 2 and 4.

IV. *Dodecahedral priſmatic Modification.*

56. *Dodecahedral priſm formed at the ſolid angles of the baſe.* (not before deſcribed) Its planes are produced by a retrogradation of the cryſtalline laminæ on the ſolid angles, ſo as to replace each of them by two planes which meet under an angle of 142° 2′. Its planes are found combined with thoſe of the hexahedral priſm No. 2, which give the cryſtal the form of a priſm of 18 ſides; in other cryſtals which, beſides the juſt mentioned planes, compriſe alſo thoſe of No. 1, the priſm is compoſed of 24 ſides. It has been likewiſe found in combination with the planes of ſix different modifications, four of which belong to dodecahedrons, one to the priſm of No. 2, and one to No. 56, producing in all 66 planes. Another variety has been obſerved by count Bournon, which, in addition to the planes of the laſt-mentioned variety, contains alſo thoſe of the priſm No. 1, and is conſequently compoſed of 72 planes. This modification, which has been found in Cumberland, is rare, but it is not improbable that its planes may be thoſe of ſeveral of the curvilinear varieties already mentioned, but which cannot be determined by the goniometer.

The cryſtals of calcareous ſpar are variouſly aggregated, and often ſo deeply imbedded, that their ſummits only are viſible. They occur of all degrees of magnitude, from minute to 14 inches in length; their ſurface is generally ſmooth, ſometimes ſtreaked or druſed. Externally from ſhining and ſplendent, to dull, ſometimes pearly; internal luſtre from ſplendent and ſpecularly ſplendent, to ſhining and gliſtening: it is moſtly a vitreous luſtre, the intenſity of which is generally in proportion with the tranſparency of the cryſtal.

Fracture foliated, rarely curved foliated; fragments rhomboidal. The maſſive is generally found in large-grained diſtinct concretions, but alſo ſometimes in teſtaceous, wedge-ſhaped, and diverging, more or leſs ſtreaked priſmatic concretions.

Tranſparency both of maſſive and cryſtallized calcareous ſpar is various; the former is however generally only tranſlucent, while the cryſtals are moſtly ſemi-tranſparent and tranſparent; and theſe poſſeſs the double refraction in a high degree.

It is ſemi-hard, between gypſum and fluor ſpar, or, (as count Bournon characteriſes its hardneſs,) juſt ſcratched by common braſs. It is brittle, eaſily frangible.

Specific gravity 27.17 as a mean. Bourn.

Some varieties, eſpecially that of browniſh-yellow colour, and part of thoſe found in the ſhell marble of Derbyſhire, are phoſphoreſcent when laid on a hot coal. The ſame quality has been obſerved, by Schumacher, in varieties from Norway.

Its chemical characters agree with thoſe of the preceding ſub-ſpecies. The pureſt Iceland ſpar is compoſed of

Lime	55 0		55.5	
Carbonic acid	34.0		44.	
Water	11.0		0.5	
	100	Bergm.	100.0	Phillips Phil. Mag. xiv.

This ſub-ſpecies is found in moſt parts of the world; but moſt abundantly it occurs in England (where almoſt all modifications have been found), in Saxony and France. Certain cryſtal forms appear to be peculiar to certain countries or localities; but this requires farther obſervations.

With regard to the Iceland ſpar it ſhould be remarked, that this very pure maſſive variety of calcareous ſpar, is far from being peculiar to that iſland; at Pergine, in Italy, as we are told by Buch, the ſame occurs in mica ſlate, as maſſes ſufficiently large to be cleft into rhomboids of upwards of two feet in length.

Calcareous ſpar is, almoſt without exception, the production of particular repoſitories; it is never ſeen to form independent beds or ſtrata. It occurs venigenous in the rocks of almoſt all formations; in the oldeſt; in Switzerland and the Pyrenees, it is accompanied with feldſpar, rock-cryſtal, &c. Alſo frequently in various metalliferous veins in gneiſs, mica ſlate, clay ſlate, ſienite, porphyry, more ſeldom in granite, frequently in grauwacke, and with ores of cobalt and copper, in the older fletz lime-ſtone. The newer fletz lime-ſtone is ſometimes traverſed by veins entirely compoſed of calcareous ſpar.

The minerals uſually accompanying calcareous ſpar are granular and compact lime-ſtone, brown ſpar, quartz, feldſpar, barytes, fluor ſpar, clay ſlate, chlorite, iron and copper pyrites, ſpathoſe iron, brown iron-ſtone, galena, blende, grey copper ore, malachite, &c.

3. *Fibrous lime-ſtone.*

This ſub-ſpecies is divided into two kinds, *a*, common, and *b*, ſtalactitical fibrous lime-ſtone (*Kalkſinter*, Wern.)

A. *Common fibrous lime-ſtone Gemeiner faſriger kalkſtein*, Wern. *Satin ſpar.*

Its colours are white, greyiſh, reddiſh and yellowiſh-white.

It occurs maſſive.

Internally it is between gliſtening and ſhining, with a pearly or ſatiny luſtre.

Croſs-fracture compact ſplintery; longitudinal fracture ſtraight or waved, fibrous; the fibres (which may be conſidered as indeterminable cryſtals) are either ſtrongly adhering to each other, and parallel, or partly detached, and tapering; they have alſo been ſeen reticularly aggregated. Fragments in moſt varieties ſplintery, alſo flattened fibrous; ſtrongly tranſlucent. Hardneſs rather leſs than that of calcareous ſpar, which it reſembles in the remainder of its characters.

Its conſtituent parts were found by Mr. Pepys to be

Carbonic acid	47.6	
Lime	50.1	
Water and loſs	2.3	
	100.0	Phil. Mag. xij.

It is a product of veins.

The fineſt variety of fibrous lime-ſtone is that of Cumberland, to which the name of ſatin ſpar is peculiarly applicable. It forms veins or *trums* of a few inches thick, in a calcareous clay; the ſalbands or liſts of theſe ſmall veins are thin layers of a blackiſh clay ſlate mixed with iron pyrites. This variety, which has ſometimes a beautiful pale roſe red tint, and perfectly pearly luſtre, is cut and poliſhed, and employed for inlaid and other ornamental works; when cut en cabochon, it ſometimes paſſes for white cat's-eye, a name which is alſo ſometimes erroneouſly, ſometimes fraudulently, given to pieces of fibrous gypſum, cut in the ſame manner.

M. de Bourbon has deſcribed a pretty variety of this ſubſtance from Matlock in Derbyſhire; it forms a very light, cellular maſs, in which the fibres, of a yellowiſh-grey colour, croſs and decuſſate one another ſo as to form the ſame kind of net which is ſeen in ſome fibrous zeolites. A variety with detached parallel fibres, which forms ſmall veins of an inch or two in thickneſs, is mentioned by the ſame author as occurring in ſhell-lime-ſtone; its fibres, of a yellowiſh-brown colour, are very delicate, and ſeparable from one another by the ſlighteſt touch. A variety with detached diverging fibres is found at Schemnitz in Hungary.

B. *Stalactitical fibrous lime-ſtone. Kalkſinter*, Wern. *Stalactite* or *Sinter*.

Its more common colours are ſnow, greyiſh and yellowiſh-white, which latter paſſes into wax and honey yellow, and yellowiſh-brown; leſs common are the green varieties of colour, ſuch as ſiſkin, piſtachio, aſparagus, mountain, and verdigris green, which latter paſſes into ſky blue; ſometimes, though rarely, it is fleſh, or peach-bloſſom red, and reddiſh-brown. When ſeveral of theſe colours occur in the ſame piece, they are in ſtripes, ſometimes running into each other, at other times perfectly diſtinct.

It occurs maſſive, tubular, reniform, globular, botroidal, coralloidal, ſtalactitic, and tuberoſe. Its ſurface is generally rough, or druſy, with minute indeterminable cryſtals; internal luſtre commonly glimmering, and pearly.

Fracture from very delicately to coarſe fibrous; fibres generally ſtraight, ſtellularly diverging, or parallel. Fragments cuneiform and ſplintery, alſo indeterminately angular. It generally occurs in curved lamellar diſtinct concretions, parallel to the external ſurface.

It is more or leſs tranſlucent, paſſing into ſemi-tranſparent. The remaining characters are thoſe of calcareous ſpar.

Specif. grav. 2.325—2.876, Briſſon; 2.741 (yellowiſh-white from Poland), Kirwan. This muſt of courſe vary according to the different degrees of purity.

Stalactitical fibrous lime-ſtone is generally found in caves, crevices, and old ſhafts, in tranſition, and fletz lime-ſtone, hanging from and covering the roofs, walls, and floors of the caves, and thus producing groups of figures, which fancy readily transforms into ſtatues, pillars, pulpits, fonts, &c. The moſt celebrated ſtalactite caves are, the grotto of Antiparos in Greece, the Baumar's hole on the Hartz, the caves of Baden, thoſe of Orenburg and Nertſhinſk in Siberia, thoſe of Matlock in Derbyſhire, of Yorkſhire, Auxelles, d'Arcy, de la Balme in France, &c.

The maſſive variety of this ſubſtance, produced by the trickling down from the roof and walls, and covering the floor of caves, is ſometimes diſtinguiſhed from ſtalactite by the appellation of *ſtalagmites*.

Sometimes the conical or cylindrical ſtalactites are terminated by a ſmall cryſtal.

The common varieties are uſed for burning to lime; the finer ſorts are employed by the ſtatuary and maſon, in countries where they occur in large maſſes. They are called *marmo alabaſtrino* by the Italians. See Marble.

The beautiful coral-like calcareous ſubſtance, called *flos ferri*, and commonly referred to ſtalactitical fibrous lime-ſtone, is a variety of *arragonite*.

4. *Pea-ſtone. Erbſenſtein*, Werner. *Pierre de pois ou Piſolite*, Broch.

Its principal colour is yellowiſh, reddiſh, and greyiſh, leſs frequently ſnow-white; the yellowiſh paſſes through yellowiſh-grey into cream yellow and yellowiſh-brown.

It occurs commonly maſſive, but alſo reniform and botroidal.

Internally it is dull. Fracture even. Fragments indeterminately angular.

It is compoſed of ſpherical diſtinct concretions, which are again compoſed of thin concentric lamellæ. Theſe globules are generally connected either by a calcareo-ferruginous cement, or they are detached; their ſize varies from that of a pea to that of a hazel-nut.

It is opaque, ſeldom rather tranſlucent on the edges. Soft; brittle; eaſily frangible.

Specific gravity 2.396, Wiedenmann.

Its chemical characters and conſtituent parts appear to be thoſe of the preceding ſub-ſpecies.

The principal locality of pea-ſtone is Carlſbad in Bohemia. A handſome variety, conſiſting of detached globules, which are generally compoſed of fine granular diſtinct concretions, is found at the baths of St. Philip in Tuſcany, and known by the name of *confetto di Tivoli*. Pea-ſtone is alſo ſaid to occur in Hungary and Sileſia.

Several opinions have been broached to account for the origin of theſe globular concretions, each of which is furniſhed with a nucleus of various dimenſions, but generally very minute; it is ſometimes a ſmall angular or rounded grain of quartz, or a particle of ſlate; and even ſmall fragments of granite have been ſeen in the centre of theſe globules. This circumſtance points out the only poſſible manner in which theſe concretions can have been produced. The ſmall bodies which ſerve as nucleus to each globule, muſt have been raiſed by, and kept floating in the agitated water of the ſprings, which being highly impregnated with calcareous particles, gradually depoſited round each of them the concentric laminæ; the globules thus produced afterwards ſunk to the bottom, where, according as circumſtances permitted it, they either remained unconnected, or were cemented into ſolid beds, ſuch as they are ſeen near the hot ſprings of Carlſbad.

The ſimilarity which ſome writers find between the pea-ſtone and the variety of compact lime-ſtone, called roe-ſtone, is not found in reality.

Lime may be obtained in a ſtate of abſolute purity, by ſeveral proceſſes from the native ſubſtances containing this earth. The analyſis of the carbonats of lime is by far the moſt ſimple, eſpecially when no other earth or metallic oxyd is preſent. This is pretty much the caſe with ſeveral of the marbles, particularly the white or ſtatuary marble. If the lime in any of theſe ſubſtances be combined with no other acid but the carbonic, let 100 grains in fine powder be diſſolved in muriatic acid. If there be any reſiduum, it may be conſidered as ſilex, or ſome ſalt of lime not decompoſable by the muriatic acid, and muſt be ſet apart. Add to the muriatic ſolution as much pure ammonia as will make it ſmell of this alkali, and all the earths, excepting lime, with metallic oxyds, if there be any, will be precipitated, leaving the lime in ſolution. If no ſubſtance be ſuſpected which is ſoluble in ammonia, the lime may be conſidered as ſeparated from the other ſubſtances, and if ſuch a ſuſpicion ſhould exiſt, the ſubſtance may be ſeparated by adding only juſt as much ammonia as will make the ſolution neutral. The lime may be precipitated from the acid with carbonat of potaſh, or that ſalt commonly called the ſub-carbonat, by which a carbonat of lime is obtained. This white powder, being ſeparated, muſt be expoſed to a ſtrong heat in a platina crucible, to ſeparate the carbonic acid, which leaves the lime in a ſtate of purity. The precipitates by the ammonia may conſiſt of magneſia, iron, and ſometimes manganeſe. The magneſia and manganeſe will be diſſolved by adding a ſolution of ſuper-carbonat of potaſh, leaving the oxyd of iron behind, which muſt be waſhed and dried. The manganeſe may be precipitated by the hydro-ſulphuret of potaſh in a ſtate of ſulphuret of manganeſe, which being waſhed, dried, and expoſed to a ſtrong heat in a platina crucible to expel the ſulphur, will leave the pure oxyd of manganeſe. The magneſia, which is yet held in ſolution by the exceſs of carbonic acid, may be finally precipitated by pure potaſh. The precipitate, being ſeparated, may be expoſed to a ſtrong heat in a platina crucible, which will give this earth in a ſtate of purity. The reſulting ſubſtances, on being weighed, will not amount to the original weight of the lime-ſtone; for, independent of the loſs by analyſis, allowance muſt be made for the loſs of carbonic acid and water. The total amount of the latter ſubſtances may be known, by expoſing a given weight in powder in a platina crucible. The loſs by weight will be carbonic acid and water. If the carbonic acid alone be required, let a given weight in powder be taken, and let a quantity of dilute ſulphuric acid, amply ſufficient to ſaturate all the ſubſtances, be accurately weighed; then let the acid and powder be mixed together, and ſtirred till the efferveſcence ceaſes: afterwards weigh the maſs; the loſs of weight will be carbonic acid. The ſame may be aſcertained by putting the powder into a gas bottle, and adding muriatic acid by degrees from an acid holder, and then collecting the gas in lime-water. The carbonat of lime ſo collected being weighed, 45 of carbonic acid may be allowed for every 100 of the carbonat.

The example given is ſuppoſed to be the moſt complicated of the carbonats of lime.. If ſilex be a component part, it will be ſeparated in the firſt ſolution, and muſt be waſhed and dried. Manganeſe is ſeldom found in lime-ſtone. It is ſaid to conſtitute the property which ſome lime has of ſetting under water.

The native ſulphat of lime or gypſum may be analyſed by the following proceſs. Let a hundred grains of the cryſtallized ſalt, in fine powder, be expoſed to a red heat for ſome time: the loſs by this treatment is the water of cryſtallization. Let the powder, after weighing, be boiled for ſome time in a ſolution of pure carbonat of potaſh, by which is obtained a carbonat of lime, and a ſulphat of potaſh, the latter being ſoluble, and the former inſoluble. To the ſulphat of potaſh, when ſeparated, add muriat of barytes, and the ſulphuric acid will be precipitated combined with the barytes. For every 100 of this ſalt, allow 33.3 of acid, by which the proportion of ſulphuric acid will be known.

The inſoluble matter firſt produced will conſiſt of carbonat of lime, and perhaps iron. By adding to this the ſupercarbonat of potaſh, the whole of the lime will be diſſolved, but the oxyd of iron will be left behind.

The lime which is diſſolved by the ſuper-carbonat of potaſh may be precipitated in the ſtate of carbonat, and made pure by a ſtrong heat in a platina crucible, to drive off the carbonic acid.

Phoſphate of lime is analyſed by diſſolving the native cryſtals in nitric acid, and adding to the ſolution acetat, or nitrat of lead, till no more is precipitated: the ſubſtance is the phoſphat of lead, which being ſeparated and weighed, will determine the quantity of phoſphoric acid, by allowing 18.4 of acid for every 100 of the phoſphat of lead. The lime which is diſſolved in the nitric acid may be precipitated by carbonat of potaſh.

The fluat of lime may be analyſed by firſt boiling it in a ſtate of fine powder with carbonat of potaſh, or ſoda, by which a fluat of potaſh or ſoda is obtained, from which the fluoric acid may be again precipitated by acetat or nitrat of lead, from which the proportion of fluoric acid may be obtained

The firſt reſiduum, which is carbonat of lime, and generally oxyd of iron, muſt be treated as in the analyſis of ſulphat of lime, to ſeparate the oxyd of iron from the lime.

The native borat of lime contains more magneſia than lime; for its analyſis, ſee the *Borat of Magneſia.*

Chemical Properties of Lime.—To obtain lime in a pure ſtate, the moſt perfect cryſtals of the carbonat ſhould be put into a covered veſſel, and expoſed to a ſtrong heat, conſiderably above redneſs, for ſeveral hours. The cryſtals will retain their ſhape, but will have loſt their tranſparency, and become beautifully white. By this proceſs the carbonic acid and water of cryſtallization are expelled, leaving the lime in a ſtate of purity.

The lime thus obtained has a cauſtic alkaline taſte, and like bodies of thoſe qualities, to a certain degree, deſtroys the texture of the ſkin, and in other reſpects acts upon animal ſubſtances in general: it alſo changes vegetable blues to green. Its ſpecific gravity is various; according to Kirwan it is 2.3. In this ſtate it is called quick-lime. Its hardneſs, immediately after it is produced from the carbonat, is not much diminiſhed; but if expoſed to the air for a certain time, it falls into an impalpable powder, which appears of a more ſplendid white than in the ſolid ſtate.

In aſſuming this form by expoſure, it is found to be heavier by one-third of its original weight. For this fact we are indebted to Mr. Dalton, who terms lime in this ſtate an *hydrat of lime.*

If it be expoſed to the air a longer time, it combines with carbonic acid, and would ultimately acquire the original weight of the carbonat.

When water is poured upon newly burned lime, it quickly ſwells with a hiſſing noiſe, abſorbing the water with great avidity, while much heat and even light are evolved.

Theſe phenomena do not ceaſe till it has abſorbed one-third of its weight: in this ſtate it is called *ſlacked* lime.

Many other ſubſtances are capable of furniſhing lime in a ſtate of tolerable purity. Of theſe are the ſtalactite of Derbyſhire, chalk, white marble, and ſome of the other marbles.

Lime is not fuſed by the greateſt heats hitherto produced, although it is ſuſceptible of fuſion by very ſlight admixture of ſome earths and metallic oxyds.

The change which takes place in all thoſe bodies which afford lime by burning, was not explained before the diſcovery of carbonic acid by Dr. Black. The peculiar qualities of quick-lime were ſuppoſed by Boyle and by Newton to ariſe from the fire fixed in it by the proceſs of burning. Others ſuppoſed its cauſticity to ariſe from the preſence of an acid formed by the heat. Dr. Black, however, demonſtrated that the qualities of lime were not to be attributed to the preſence of any ſubſtance in lime, but to the abſence of water and carbonic acid, the latter of which he at the ſame time diſcovered.

If lime be added to water at 60°, it diſſolves about .005 of its weight. It appears from the experiments of Dalton, that cold water diſſolves more lime than hot; a property not common to other bodies. According to this ingenious chemiſt, water at 60° diſſolves $\frac{1}{778}$ of its weight; at 130°, $\frac{1}{972}$ part; and at 212°, $\frac{1}{1270}$ part.

The ſolution of lime in water is commonly called *lime-water*. When lime-water is expoſed to the air, it ſoon becomes covered with a pellicle, exhibiting the priſmatic colours, which gradually thickens into a cruſt, and by its weight falls to the bottom of the liquid. This has been called the cream of lime. It is produced by the lime combining with the carbonic acid of the atmoſphere, by which it becomes inſoluble, and is ſeparated from the water.

The ſame ſeparation takes place by breathing through lime-water, from the preſence of the carbonic acid afforded by reſpiration.

Lime combines with ſeveral of the combuſtible bodies, forming peculiar compounds. When two parts of lime and one of ſulphur are heated together in a crucible, they unite in forming a reddiſh maſs, which is the ſulphuret of lime. When this compound is moiſtened with water, the latter is decompoſed. One portion of the hydrogen of the water unites with a portion of ſulphur, and eſcapes under the form of ſulphuretted hydrogen gas. Another portion combines with a part of ſulphur and lime, forming a triple compound of ſulphur, hydrogen, and lime, called an hydroguretted ſulphuret of the earth, while the oxygen of the decompoſed water, with the remainder of the ſulphur and lime, forms the ſulphat of lime.

The hydroguretted ſulphuret of lime is of a greeniſh-yellow colour. If expoſed to the air for ſome time, it gradually abſorbs oxygen, and is converted into ſulphat of lime. If, however, it be kept in ſolution in water in a cloſe veſſel, ſome of the ſulphur gradually precipitates, leaving in ſolution the hydroſulphuret of lime. See *Sulphuretted* HYDROGEN.

The hydroguretted ſulphuret of lime has the property of diſſolving charcoal as well as ſome metals, and metallic oxyds.

The hydroſulphuret of lime is formed by paſſing ſulphuretted hydrogen gas through lime-water. This gas unites with the lime, forming a compound of a diſagreeable bitter taſte.

Phoſphuret of Lime.—This ſubſtance may be formed as follows: into an earthen tube about 12 inches long, or a glaſs tube coated with equal parts of ſand and pipe-clay, and cloſed at one end, put ſome pieces of phoſphorus, ſo as to lie at the cloſed end of the tube. Let the remainder of the tube be filled with bits of newly burned quick-lime, about the ſize of large peas, and then ſtop the end of the tube with a chalk or dry clay ſtopper, not fitting very tight. Let the tube be now paſſed through two holes of a portable furnace, the furnace being about ſix inches in diameter. One of the holes muſt be a little below the other, ſo as to give the tube a ſmall inclination to the horizon, the open end being higheſt. Let the middle part of the tube be heated red-hot, and then draw gradually the end containing the phoſphorus into a heat ſufficient to ſublime the phoſphorus. The vapour of the latter will now paſs through the red-hot lime, a great portion of which will combine with it, forming the phoſphuret of lime. If the vapour of the phoſphorus come too rapidly it paſſes by the looſe ſtopper, but ſo ſoon as the whole has been ſublimed, let the end be ſtopped more cloſely; and let the tube be withdrawn, keeping it well ſtopped till it is perfectly cold. The whole of the contents of the tube may now be ſhaken out, and the darkeſt coloured pieces ſelected, which muſt be kept in a well ſtopped dry bottle.

The phoſphuret of lime, thus prepared, is of a deep brown colour.

When thrown into water it does not diſſolve, but bubbles of gas are ſeen to proceed from it, which coming to the ſurface burſt, and inflame ſpontaneouſly, producing a beautiful ring of white ſmoke.

Theſe phenomena are occaſioned by the preſence of a ſubſtance called phoſphuretted hydrogen gas, which has the ſingular property of taking fire at the common temperature. The water is decompoſed by the phoſphuret. The hydrogen combines with a portion of the phoſphorus, forming the gas above-mentioned, while the oxygen of the ſame combines with the remainder of the phoſphorus, forming phoſphoric acid, which with the lime forms phoſphat of lime. Beſides this, a portion of the gas firſt combines with the phoſphuret, forming an hydroguretted phoſphuret, which, if taken from the water before it is decompoſed, and wiped dry, retains the gas. On pouring muriatic acid upon it the gas is liberated, and inſtantly inflames.

Lime does not combine with any other of the inflammable bodies, but it combines with ſeveral of the metallic oxyds.

When any of the oxyds of lead are boiled with lime and water, a portion of the oxyd is diſſolved. The ſolution, on evaporation, affords ſmall cryſtals.

This compound has the property of ſtaining wool, hair, nails, horn, and ſome other animal ſubſtances, of a deep and agreeable brown, which by expoſure to the air diſappears. This colour appears to be the brown oxyd of lead combined with the ſubſtance. An acid inſtantly diſſolves it, and the colour diſappears.

Lime alſo diſſolves the red oxyd of mercury, of the ſolution affording yellow cryſtals.

Lime has the property of combining with ſome of the other earths and metallic oxyds, forming mortars of different qualities. Dr. Higgins, in his book upon cements, propoſed the following as the beſt compoſition for common mortar: three parts of fine waſhed ſand, four parts of coarſer ſand, one part of newly ſlacked lime made up with as little water as poſſible, which he recommends to be ſoft water. Mortar, thus formed, becomes very hard in a little time, and continues to become harder for a great length of time. Hence has ariſen the miſtake, of the ancients being in ſome ſecret of making mortar, which is not known to the moderns.

A great improvement has lately been made in making cements by combining lime with oxyd of iron and manganeſe. An iron ore abounding with clay, a calcareous matter, and pyrites, have been introduced under the name of "Parker's cement," from the name of the inventor and patentee. After burning and grinding to powder, it has the property of ſetting rapidly when mixed with water, and even under water. This rapid induration can be explained, only by ſuppoſing a great affinity to exiſt between the different earths and metallic oxyds in its compoſition.

Lime had long been ſuſpected to be a compound body; but it is only lately that this fact has been verified by experiment. From the general reſemblance of the earths to the oxyds of many of the metals, Lavoiſier ſuppoſed them to be oxyds of metals, which had ſo great an affinity for oxygen as not to be reduced by ordinary means. Several unſucceſsful attempts were made to realize this conjecture by different philoſophers.

In the late experiments of Mr. Davy, in which he diſcovered the fixed alkalies to conſiſt of metallic baſes united to oxygen, this philoſopher was led to ſuppoſe that the earths, at leaſt thoſe having alkaline qualities, might be compounds of peculiar baſes united to oxygen; and in this conjecture he ſeems not to have been miſled.

Mr. Davy did not ſucceed in obtaining the metaloid of lime in a pure ſtate, as in the inſtances of potaſh and ſoda. He fuſed a portion of lime and potaſh together, and expoſed this compound to the action of the Galvanic battery, in the ſame way he had done potaſh and ſoda. He obtained by this means a metallic ſubſtance, which differed from the metal of potaſh in being leſs fuſible, and took fire as ſoon as it was formed. He ſucceeded better by moiſtening the lime, and mixing it with red oxyd of mercury. Theſe were placed upon a plate of platina, connected with the poſitive end of the battery. A cavity being made in the mixed maſs, a globule of mercury, weighing about 60 grains, was placed in it, and a connection formed between the mercury and the other end of the battery by means of a platina wire. By this means, the lime underwent decompoſition; its metallic baſe combining with the mercury. This amalgam was then diſtilled in a glaſs tube, filled with the vapour of naphtha; by which the mercury, to a certain extent, was expelled, leaving a white maſs of a metallic appearance, and of the colour of ſilver. This ſubſtance, which no doubt was the baſis of lime, had ſo great an attraction for oxygen, that Mr. Davy could not ſucceed in examining its properties before it was burned and reconverted into lime. He has given it the name of *Calcium.*

Salts of Lime.—Lime combines with the different acids, forming peculiar compounds called ſalts.

It poſſeſſes a ſtronger attraction for the acids than alumine, magneſia, or any of the metallic oxyds: hence the exiſtence of aluminous, magneſian, and metallic ſalts are incompatible with lime. Several of the ſalts of lime are found native in great abundance, particularly the carbonat and ſulphat. We rarely find a mineral water free from ſome of the ſalts of lime. They are moſtly, however, the carbonat, ſulphat, and muriat; the reſt of the native ſalts being inſoluble in water.

Sulphat of Lime.—This ſalt may be formed by diſſolving lime in the muriatic or nitric acid, and adding ſulphuric acid to the clear ſolution, till the precipitation ceaſes. The ſubſtance which falls to the bottom is the ſulphat of lime, in a ſtate of white powder. It abounds ſo plentifully in nature, that it is never manufactured for ſale. The native cryſtals are right-angled priſms, with rhomboidal baſes. It is alſo found ſometimes in cryſtals of the form of four and ſix-ſided priſms, which are generally very tranſparent. In ſome ſpecimens theſe cryſtals are very ſmall, giving the maſs a fibrous appearance. It occurs in Derbyſhire, in large ſemitranſparent maſſes, moſtly abounding with yellowiſh-brown ſtreaks, occaſioned by the preſence of iron. Great quantities of this laſt is worked into ornaments, and uſed alſo in ſculpture.

This ſalt is ſoluble in 460 parts of water at 60°.

It is not altered by expoſure to the air, at the common temperature: if, however, it be heated to ignition, it loſes its water of cryſtallization, and falls into a fine white powder. This powder, if left in the air, would re-abſorb the water, and aſſume its chemical qualities. When this powder, newly calcined, is mixed with water to the conſiſtence of pulp, it ſoon begins to ſtiffen, becomes warm, and in a little time becomes very hard. During this ſtate it expands with great force, ſo as to break very ſtrong veſſels. It admits of the moſt delicate caſts being taken by means of it. The ſudden expanſion, at the time it is loſing its liquid form, forces it into the moſt minute cavities. It is employed by artiſts for makings caſts of buſts, and different ornaments. The ſame properties render it of great value to the manufacturers of pottery and porcelain. It is uſed in ſome countries for making the floors of upper rooms, as a ſubſtitute for wood. In the laying of theſe floors, ſome idea may be given of its expanſive force when ſetting. Thin ſlips of wood, of a thickneſs equal to the expanſion of the floor, are placed between the wall and the pulpy maſs, till the time it begins to aſſume the ſolid form. Theſe ſlips are then inſtantly removed, to make room for the expanſion. If this precaution were not taken, ſo great would be the force, as to puſh out the wall in that part.

Sulphat of lime is compoſed, according to Bergman, of 46 acid, 32 baſe, and 22 water, in the 100. Kirwan's analyſis gives 59 acid and 41 baſe in the 100. Wenzel makes it 59.84 acid and 40.16 baſe.

Dalton makes the atom of lime 24, and ſulphuric acid $13 + 3 \times 7 = 34$: hence, $\frac{24 + 34}{34} = \frac{100}{58.6}$, which gives 58.6 acid, and 41.4 baſe, = 100.

This ſalt is ſaid to be uſed in America as a manure with much ſucceſs; but has not been uſed in this country.

Sulphite of Lime.—This ſalt may be formed by adding ſulphurous acid to the nitrat or muriat of lime. A white powder is precipitated, which is ſulphite of lime. This ſalt is ſoluble in 100 parts of water. It is ſlightly effloreſcent in the air, and ultimately is converted into ſulphat. When heated, ſome ſulphur is ſublimed, and it aſſumes the ſtate of ſulphat. This ſalt is compoſed of 48 acid, 47 lime, and 5 water, = 100. It has not been applied to any uſe.

Nitrat of Lime.—The nitrat of lime may be formed by adding powdered carbonat of lime to nitric acid, till the efferveſcence ceaſes. When the ſolution is evaporated to the conſiſtence of ſyrup, and placed in a very cold ſituation, ſmall needle-ſhaped cryſtals, after ſome time, will appear: the ſhape of theſe is ſix-ſided priſms. This ſalt is cryſtallizable, but with difficulty, owing to its great ſolubility; or, in other words, to its great affinity for water; and when the cryſtals are formed, they ſoon attract moiſture from the air, and diſappear.

When the ſolution is evaporated to dryneſs, and the heat continued a ſhort time, the maſs acquires the property of ſhining in the dark. This ſalt is known by the name of Baldwin's phoſphorus.

When a ſtronger heat is applied, up to ignition, the ſalt is decompoſed; the acid is reſolved into nitrous gas, oxygen, and nitrogen. It might be employed, like nitre, to obtain a tolerably pure oxygen for experiments of combuſtion. Its decompoſition by heat alſo furniſhes an elegant method of procuring lime in a ſtate of purity. The analyſis of this ſalt by Richter gives, in the 100, 63.9 acid, and 36.1 baſe. That of Kirwan gives, in the 100, 54.44 acid, 32 baſe, and 10.56 water. Dalton makes the atom of nitric acid $5.4 + 2 \times 7 = 19.4$, and concludes the ſoluble nitrats to be ſuper-ſalts: hence, $\frac{19.4 \times 2 + 24}{19.4 \times 2} = \frac{100}{58.6}$, which gives 58.6 acid, and 41.4 of lime, = 100.

Muriat of Lime.—This ſalt is generally formed in manufacturing the carbonat of ammonia. The muriat of ammonia is mixed with carbonat of lime, in a veſſel which is expoſed to a heat capable of ſubliming the carbonat of ammonia, which leaves behind the muriat of lime. It may be alſo formed by adding carbonat of lime to muriatic acid. When the ſolution is evaporated to the conſiſtence of ſyrup, and ſet in a cool place equal to 32°, it cryſtallizes into ſix-ſided priſms, terminated by pyramids. Theſe cryſtals, however, ſoon deliqueſce, from their great attraction for moiſture, and aſſume the liquid form. Reduced to a ſtate of dryneſs, it is uſed for the purpoſe of drying different gaſes.

Water at 60° diſſolves four times its weight of this ſalt; while at 100°, it diſſolves in any proportion. It diſſolves in alcohol in a great proportion, producing heat. When the dry ſalt is mixed with ſnow, it produces great cold, and is employed to great advantage in freezing mixtures. When it is expoſed to heat above ignition, ſome of the acid eſcapes, reducing it to the ſtate of ſubmuriat. In this ſtate it has the property of ſhining in the dark, and has, in conſequence, been called the phoſphorus of Homberg. It is compoſed, according to the analyſis of Bergman, of 31 acid, 44 baſe, and 25 water, in 100. Kirwan makes it 42 acid, 50 baſe, and 8 water; and Wenzel, 51 acid and 49 baſe. Dalton makes an atom of muriatic acid 22; then lime being 24, $\frac{24 + 22}{22} = \frac{100}{47.83}$: hence we have, from theſe data, 47.83 of acid, 52.17 of baſe.

Oxymuriat of Lime.—It appears that ſuch a ſalt does not exiſt, except in the dry ſtate. When it is thrown into water, it is converted into the muriat, and oxygen eſcapes.

The ſalt, which the bleachers call the oxymuriat of lime, is in fact the hyper-oxymuriat. It is made by paſſing the oxymuriatic acid gas through a mixture of lime and water, in a Woulfe's apparatus. (See LABORATORY.) The lime is at length taken up, and the liquid becomes colourleſs. It is decompoſed by the muriatic acid, affording oxygen and oxymuriatic acid. It is uſed in bleaching to a great extent. See BLEACHING.

Phoſphat of Lime.—This ſalt conſtitutes the baſis of bones, and is a component part of moſt animal ſubſtances. It may be prepared by adding muriat or nitrat of lime to phoſphat of ſoda; or, cheaper, by diſſolving the earth of bones, which is a mixture of the ſubphoſphat and carbonat of lime, in muriatic acid, and adding pure ammonia to the ſolution. The phoſphat of lime will be precipitated alone, leaving the exceſs of lime diſſolved in the acid. This ſalt is in the form of powder of a white colour; the native ſalt, which has been deſcribed, being alone capable of the cryſtalline form.

Several of the acids, but particularly the ſulphuric, decompoſe this ſalt, by taking a part of the lime, and leaving it in the ſtate of ſuperphoſphat. Phoſphat of lime is compoſed, according to the analyſis of Klaproth, of 30.5 of acid and 69.5 baſe. Fourcroy and Vauquelin make it 41 acid and 59 baſe; Richter, 45 acid and 55 baſe; and Eckeberg, 39 acid, 36 baſe, and 25 water. By Dalton's hypotheſis, the phoſphoric acid is $9 + 2 \times 7 = 23$: then, $\frac{23 + 24}{23} = \frac{100}{48.9}$, making the acid, in 100, 48.9 acid, the baſe being 51.1.

Superphoſphat of Lime.—When ſulphuric acid is added to the phoſphat of lime, the former being one-third of the latter by weight, a portion of ſulphat of lime will be formed, which will be precipitated, leaving the ſuperphoſphat diſſolved. It may alſo be formed by diſſolving 47 parts of the phoſphat in 23 parts of real acid.

This ſalt cryſtallizes by evaporation, in brilliant plates, having a pearly appearance. The taſte of theſe cryſtals is ſtrongly acid. Indeed it was once taken for the phoſphoric acid, and was diſtilled with charcoal, to obtain phoſphorus. This ſalt is now decompoſed by the acetat of lead; and the phoſphat of lead is uſed for that purpoſe, which is found a great improvement in the preparation of phoſphorus.

When this ſalt is heated in a crucible at a little more than a red heat, it fuſes; and, on cooling, aſſumes the appearance of a tranſparent glaſs, which has been called phoſphoric glaſs. Its compoſition, according to the analyſes of Fourcroy and Vauquelin, is 54 acid and 46 lime.

Fluat of Lime.—This ſalt is not a product of art, but is found native in Derbyſhire, and other counties abounding with lead. Its cryſtals are in the form of cubes.

When this ſalt is coarſely powdered, and laid upon a hot plate, a little ſhort of ignition, it gives a beautiful blueiſh light, not much unlike the flame of burning ſulphur in common air. The artificial fluat alſo poſſeſſes this property.

When the fluat of lime is expoſed to a ſtrong heat, it melts, and, on cooling, becomes tranſparent. The facility with which it fuſes, and renders other earthy ſubſtances fuſible, is taken advantage of in the reduction of lead, and other metals. Hence it has derived its name from acting as a flux.

This ſalt is decompoſed by the nitric and ſulphuric acid, by ſeizing the lime, while the fluoric acid gas is diſengaged. Guy Luſſac and Thenard have lately ſhewn, that the gaſeous form of its acid is cauſed by the preſence of ſilex; ſince, when it is diſengaged from any baſe where ſilex is not preſent, the acid aſſumes the liquid form. See SILEX.

Its analyſis, by Klaproth, is 32.25 acid and 67.75 baſe; by Dr. Thomſon, $32\frac{1}{3}$ acid and $67\frac{1}{3}$ lime.

Borat of Lime.—This ſalt may be formed by mixing the muriat of lime with a ſolution of borat of ſoda. The ſalt is precipitated in the ſtate of white powder, which is inſoluble in water: few of its properties are known.

Carbonat of Lime.—This ſalt, in the native ſtate, is the moſt abundant of all the calcareous ſalts.

Although the primitive forms of the cryſtals of it are rhomboidal priſms, this figure has been ſo differently arranged as to form a numerous variety of ſecondary forms. The neutral ſalt of this ſpecies is inſoluble in water; but it becomes ſoluble, to a certain degree, with an extra doſe of acid.

The carbonat of lime may be formed by adding carbonat of potaſh to muriat of lime. It conſiſts of 45 acid and 55 lime.

According to the experiments of ſir James Hall, when the carbonat of lime is expoſed to a red heat, in a cloſe veſſel, ſuch as a gun barrel, it melts; and, on cooling, is found to retain its original properties, with the exception of loſing ſomething leſs than 4 or 5 *per cent.* of carbonic acid.

Supercarbonat of Lime.—When the ſupercarbonat of potaſh is added to muriat of lime, a portion of lime will remain on ſolution, which is not the carbonat of lime, but a ſupercarbonat. This ſalt is very frequently found in mineral waters, eſpecially in lime-ſtone countries, and in countries abounding with marle.

A carbonat of potaſh being added to a ſolution of this ſalt, takes one doſe of acid from it to form a ſupercarbonat, and the carbonat of lime is thrown down. When the ſupercarbonat of potaſh is added, no change takes place. When lime-water is added to water diſſolving the ſupercarbonat of lime, the lime of both aſſumes the ſtate of carbonat, and fall down together.

When the ſupercarbonat of lime is expoſed to a boiling heat for ſome time, the ſecond doſe of acid is expelled, and the remaining carbonat is precipitated. This ſalt, however, is not immediately decompoſed by boiling, but requires to boil for ſome time.

Acetat of Lime.—If carbonat of lime be added to the acetic acid, an efferveſcence will take place, and the lime will be diſſolved in the acetic acid, forming acetat of lime. If the ſolution be evaporated, it affords ſmall cryſtals of a white colour, having a ſilk appearance.

It has a bitter acid taſte.

It is compoſed of 65.11 acid and 34.89 lime.

Oxalat of Lime.—This ſalt is formed by dropping the oxalat of ammonia into any ſolution of lime. It appears to be the moſt inſoluble of all the ſalts of lime. It is in the form of white powder, and is compoſed, according to Bergman, of 48 acid, 46 lime, and 6 water.

Tartrat of Lime.—If carbonat of lime be added to a ſolution of the ſupertartrat of potaſh, the exceſs of tartaric acid combines with the lime, which falls in the ſtate of inſoluble powder. It is from this inſoluble tartrat that the tartaric is obtained, by means of ſulphuric acid.

Citrat of Lime.—This ſalt, like the laſt, is formed by adding the carbonat of lime to citric acid in the lemon juice. The ſalt is the inſoluble powder which falls to the bottom. It is from this ſalt that the citric acid is obtained pure, by the ſuperior affinity of ſulphuric acid.

It conſiſts of 62.66 acid and 37.34 lime.

Pruſſiat of Lime.—The pruſſiat of lime is formed by diſſolving lime in the pruſſic acid. It is decompoſed by all the acids, and is of little permanence. The ſalt commonly, but improperly, called by this name, is a triple ſalt, containing both lime and iron. It is made by adding 56 parts of lime water to two parts of Pruſſian blue, well waſhed in hot water, boiling them for ſome time till the lime is ſaturated. The ſolution is of an olive colour, and affords cryſtals by evaporation. The ſolution of this ſalt is a valuable teſt for iron in mineral waters.

The reſt of the ſalts of lime are not of any importance, as far as we at preſent know.

The arſeniats and molybdat of lime are inſoluble in their neutral ſtate: the former is ſoluble in exceſs of acid.

Succinat of Lime is difficultly ſoluble.

Benzoat of Lime is ſoluble, and may be obtained in cryſtals.

Chromat of Lime is ſoluble and cryſtallizable.

Suberat of Lime diſſolves in hot, but little in cold water.

Camphorat of Lime is ſparingly ſoluble.

LIME, in *Agriculture*, a ſoft friable ſubſtance, obtained by calcining or burning various calcareous materials, ſuch as chalk, marble, lime-ſtone, ſhells, &c.

This is a ſubſtance which is in different ſtates, according to the particular circumſtances under which it exiſts. When newly made, from its great power of deſtroying the texture of bodies, it is termed cauſtic or quick-lime. It is alſo ſometimes called ſhell-lime or ſhells. In this ſtate, when uſed as manure, it operates with the greateſt violence, diſſipating and robbing the ſoils, to which it is applied, of their moiſture and other fluid matter: but after being expoſed to the atmoſphere for ſome time, from its property of quickly abſorbing moiſture and carbonic acid from it, it becomes mild or effete, and is termed carbonat of lime. When applied to land in this ſtate, it acts with much more mildneſs, only promoting the reſolution of the matters in which it comes in contact, by forwarding the natural proceſs of putrefaction. It has alſo leſs tendency to produce a mortary hardneſs in the poorer ſorts of clayey ſoils. But beſides theſe differences, there are others ariſing from the ſubſtances which are combined with the calcareous matters employed, as has been lately ſhewn by the ingenious experiments of Mr. Tennant, ſtated in the ſecond part of the Philoſophical Tranſactions for the year 1799. Having been informed that two kinds of lime were uſed in agriculture, which differed greatly in their effects,—one of which it was neceſſary to uſe ſparingly, and to ſpread very evenly over the land, as it was ſaid that a large proportion of it diminiſhed the fertility of the ſoil, and that, wherever a heap of it had been left on one ſpot, all vegetation was prevented for many years; and that of this kind of lime, 50 or 60 buſhels on an acre were as much as could be uſed with advantage; while of the other ſort of lime, a large quantity was never found to be injurious, and that the ſpots which were entirely covered with it became remarkably fertile, inſtead of being rendered barren:—having analyſed thoſe two kinds of lime, he found that the latter conſiſted ſolely of calcareous earth; but that the former contained two parts of magneſia, with three parts of calcareous earth. He afterwards proved, that though vegetable ſeeds would grow equally well in both theſe kinds of lime-ſtone, when ſimply reduced to powder; yet that, when they were calcined ſo as to become lime, and both of them ſtrewed about the tenth of an inch thick on garden mould, the magneſian lime prevented nearly all the ſeeds which had been ſowed from coming up, while no injury was occaſioned by the calcareous lime, when uſed under the ſame circumſtances.

It may be noticed, that this valuable diſcovery ſeems in ſome meaſure to explain the cauſe of the variety of opinion that has been maintained reſpecting the application of lime, which ſome have ſuppoſed to be of little or no advantage, and even injurious to land; which has been owing probably to their having employed the magneſian lime, or uſed it in too large proportions.

This philoſophical inquirer firſt found magneſian lime near the town of Doncaſter, and afterwards at York, at Matlock in Derbyſhire, at Breeden in Leiceſterſhire, and at Workſop in Nottinghamſhire. He aſſerts, that the cathedral and walls of York are built with this magneſian lime-ſtone; and that at Matlock the magneſian and calcareous lime-ſtones are contiguous to each other, the rocks on the ſide of the river Derwent, where the houſes are built, being magneſian, and on the other ſide calcareous. He found alſo, that in this ſituation the magneſian lime-ſtone was incumbent on the calcareous: for, in deſcending into a cavern formed in that rock, he found a ſeparate vein of calcareous lime-ſtone, which was full of ſhells, but contained no magneſia;

neſia: and concludes, that, in general, the magneſian lime-ſtone may be eaſily diſtinguiſhed from the calcareous, by its ſolution in acids being much ſlower, and that it contains generally very few ſhells; but that theſe, when preſent, are impregnated with magneſia.

In the Philoſophy of Agriculture it is remarked alſo, that all lime-ſtone may be divided into three kinds: firſt, the rocks which remain, where they were formed from ſhells beneath the ocean, except that they were afterwards elevated by ſub-marine fires; ſecondly, into alluvial lime-ſtone, as thoſe which have been diſſolved in water, and ſimply precipitated, as the beds of chalk, which contain only the moſt inſoluble remains of ſea animals, as the teeth of ſharks; and, thirdly, thoſe which, after having been diſſolved and precipitated, have been long agitated beneath the ſea, till the particles have been rolled ſo againſt each other, as to acquire a globular form, which is ſaid to reſemble the roe or ſpawn of fiſh, and which contain very few ſhells, or none, as the Ketton ſtone, and that which he has ſeen on Lincoln heath, extending almoſt from Sleaford to Lincoln. Now, ſays he, as the ſalts of the ſea conſiſt of only two kinds; common ſalt, or muriat of ſoda, and vitriolated magneſia, commonly called Epſom ſalt, which, in the ſea-waters ſurrounding this iſland, are found at a medium to exiſt in the proportion of one-thirtieth part of common ſalt and one-eightieth part of vitriolated magneſia, compared to the quantity of water; and, ſecondly, as theſe ſalts are believed by many philoſophers to have been formed by vegetable and animal matters, which principally grew upon the ſurface of the dry land, after it was raiſed out of the primeval ocean; and that, in conſequence, the ſaltneſs of the ſea was poſterior to the formation of the primeval rocks of lime-ſtone; we may underſtand why thoſe lime-ſtone ſtrata, which have not been diſſolved or waſhed in ſea-water ſince the ſea became ſalt, are not mixed with magneſia. The chalk, he ſuppoſes, muſt have been diſſolved and precipitated from water, as it exactly reſembles the internal part of ſome calcareous ſtalactites which he has in his poſſeſſion; yet there is no appearance of its component particles having been rubbed together into ſmall globules, and may not, therefore, have been removed from the ſituation where it was produced, except by its elevation above the ſurface of the ocean. But that alluvial lime-ſtone, which conſiſts of ſmall globules adhering together, called Ketton lime-ſtone, and of which there appears to be a bed 10 miles broad from Beckingham to Sleaford in Lincolnſhire, and 20 miles long from Sleaford to Lincoln, he ſuſpects may probably conſiſt of magneſian lime-ſtone; which is alſo ſaid in that country to do no ſervice to vegetation: for this alluvial lime-ſtone, by having evidently been rolled together beneath the ſea, by which the ſmall cryſtallized parts of it have had their angles rubbed off, is moſt likely to have thus been mixed with the magneſia of the ſea-water, which, as has been obſerved, is ſaid to contain one-eightieth part of its weight of vitriolated magneſia.

It is further remarked, that at the lime-works at Ticknal, near Derby, there appears a ſtratum of alluvial lime-ſtone, like Ketton lime-ſtone, which they do not burn for ſale, over the bed of the calcareous lime-ſtone, which they get from beneath the former, and calcine for ſale. It is probable, he thinks, that the ſuperior bed may contain magneſia, which has rendered it not ſo uſeful in agriculture. It is ſtill more probable that alluvial lime-ſtone has acquired its mixture of magneſia from the ſea-water; as magneſia, in its uncalcined ſtate, will precipitate lime from water, as obſerved by Dr. Alſton, who thence propoſes to render water pure and potable, which has been long kept at ſea free from putridity by having lime mixed with it, by precipitating the lime by the addition of mild magneſia.

The lime from Breedon is magneſian, that from Ticknal (which is ſold) is calcareous, he believes; and ſome farmers in the vicinity of Derby aſſert, that two loads of Breedon lime will go as far, that is, will apparently do as much ſervice to their land, as three loads of Ticknal lime. Breedon lime, he is alſo informed, is preferred in architecture, and is ſaid to go further in making mortar; which, he ſuppoſes, means that it requires more ſand to be mixed with it. In the Account of the Agriculture of the Midland Counties, lime made at Breedon, near Derby, is ſaid to be deſtructive to vegetables, when uſed in large quantities; and in Nottinghamſhire it is aſſerted, that the lime from Critch, in Derbyſhire, is ſo mild, that thiſtles and graſs ſpring up through the edges of large heaps of it, when laid in the fields. Dr. Fenwick of Newcaſtle obſerves, that the farmers in that country divide lime into hot and mild; which Mr. Tennant believes to mean magneſian and calcareous lime.

By experiments which were made by Mr. Tennant, by ſowing ſeeds of colewort on various mixtures of calcined magneſia with ſoil, and of calcareous lime with ſoil, he found thirty or forty grains of lime did not retard the growth of ſeeds more than three or four of calcined magneſia: hence, what can we conclude, but that, as they both injure vegetation in large quantities, they may both aſſiſt vegetation in ſmall ones? and that this is more probable, as the farmers believe that they find both of them uſeful, though in different quantities; and as the magneſia would form Epſom ſalt, if it met with vitriolic acid, which Dr. Home found, from his experiments, to be friendly to vegetation, when uſed in very ſmall quantities. More accurate obſervations and experiments are, however, Dr. Darwin thinks, wanting on this ſubject.

The moſt certain way to know whether any ſort of ſtone be fit for making lime is to drop upon it a little aquafortis, ſpirit of ſea-ſalt, or oil of vitriol. All ſtones on which the above, or any other ſtrong acid, efferveſces or riſes in bubbles, are calcareous ſtones, or will burn to lime; and the ſtronger the efferveſcence is, the fitter they are for that purpoſe.

And as in the uſe of calcareous matter as a manure, much depends upon its being brought into a fine powdery ſtate, it ſhould always, where fuel can be obtained at a moderate expence, be prepared by burning, as that is the eaſieſt and moſt efficacious mode of reducing lime-ſtone to powder that ever was invented, and therefore ought always to be adopted where neceſſity does not prevent it. Reducing lime-ſtone to powder by calcination is alſo, he remarks, attended with this farther advantage to the farmer, that it conſiderably diminiſhes his expence of carriage. Pure lime-ſtone loſes about two-thirds of its weight by being thoroughly burned; ſo that the man who is obliged to drive this manure from a great diſtance, will find a very conſiderable ſaving by driving it in the ſtate of ſhells; but if it were reduced to a powder by mechanical triture, he could not be benefited by this circumſtance. Many perſons chooſe to drive lime-ſtone from a conſiderable diſtance and burn it at home; but it is obvious they then ſubject themſelves to a very heavy charge in carriage, which would be avoided by an oppoſite conduct. This, therefore, ought never to be practiſed but where other circumſtances may counterbalance this unfavourable one. But as lime-ſtone is often in its native ſtate mixed with ſand in various proportions, and as ſand loſes nothing of its weight by calcination, it muſt happen that thoſe kinds of lime-ſtone which contain the largeſt proportion of ſand will loſe leaſt in calcination, and of courſe afford the weighteſt lime-ſhells.

Hence it is obvious, that thoſe who are under the neceſſity of driving lime from a great diſtance ought to be particularly careful to make choice of a kind of lime-ſtone as free from ſand as poſſible, and to drive it in the ſtate of ſhells, as they will thus obtain an equal quantity of manure at the leaſt expence of carriage that is poſſible; and the lighteſt ſhells ought, of courſe, to be always preferred. When lime is ſlaked, that which contains moſt ſand falls moſt quickly, and abſorbs the ſmalleſt proportion of water. What is pure requires a very large proportion of water, and is much longer before it begins to fall. Hence it happens that thoſe who drive ſandy lime-ſhells in open carriages, muſt be very careful to guard againſt rain, becauſe a heavy ſhower would make the whole fall, and generate ſuch a heat as to be in danger of ſetting the carts on fire; whereas pure lime-ſhells are in no danger of being damaged by that circumſtance. The writer has ſeen a cart loaded with ſuch ſhells, which had been expoſed to a continued ſhower of rain, as violent as is ever known in this country, for more than three hours, and ſeemed hardly to be affected by it in the ſmalleſt degree. He ought, he ſays, to obſerve, however, that his experiments were confined to only one kind of pure lime, ſo that it is not from hence demonſtrated that all kinds of pure lime will be poſſeſſed of the ſame qualities. Lime-ſhells formed from the pureſt lime-ſtone require more than their own weight of water to ſlake them properly; whereas, ſome kinds of lime-ſhells that contain much ſand do not require above one-fourth part of that quantity. He has found, by experiment, that pure lime-ſhells cannot be ſlaked with leſs than about one-fourth more than their own weight of water. When ſlaked in the ordinary way, the ſame lime-ſhells took more than double their weight of water.

Hence it is much worſe economy, in thoſe who have pure lime-ſhells, to ſlake and carry them home in the ſtate of powdered lime, than it is in thoſe who have only a ſandy kind of lime-ſhells to make uſe of.

It is farther ſuggeſted that it is even, on ſome occaſions, more adviſable for thoſe who have very ſandy lime, to drive it in the ſtate of powdered lime than in that of ſhells; for, as it is dangerous to give that kind of lime-ſtone too much heat, leſt it ſhould be vitrified, thoſe who burn it can never be certain that the whole of the ſtone will fall to powder when water is added, till they have actually tried it; nor do they think it a great loſs if ſome part of it ſhould be imperfectly burned, as it requires much leſs fuel on a future occaſion than freſh lime-ſtone; and therefore they much rather chooſe to err on this than on the oppoſite extreme. But ſhould any one attempt to drive this poor ſort of lime in the ſtate of ſhells, he would be in danger of carrying home many ſtones that would never fall; which would more than counterbalance the benefit he would derive from the want of the ſmall quantity of water that is required to ſlake it. On theſe accounts it is ſuppoſed it may be admitted as a general rule, that thoſe who can have acceſs to lime-ſtone which is free of ſand, will ſave a great deal in the carriage of it by driving it in the ſtate of ſhells; and that, on the contrary, it will be moſt economical, in thoſe who can only get lime of a very ſandy quality, to drive it in the ſtate of powdered lime. Hence it follows, that the practice which now prevails, of carrying ſhell-lime by water from one part of the country to another, is only an imaginary ſaving, obtained at a very high riſk, to thoſe who drive ſhells of a ſandy quality; but a real and unequivocal advantage of very high importance to the community at large, if theſe ſhells are obtained from a pure lime-ſtone. Theſe obſervations relate only to the ſaving of carriage to the farmer; which, however, is an article of great importance to him.

But there are ſome other particulars that may alſo equally affect him in this way, and in the application of the lime to his ground. A vague opinion in general prevails in every part of the country, that one ſort of lime may be more valuable than another; but it does not appear that farmers have hitherto had any rule to direct them in the choice of different ſorts of lime; ſome eſteeming one ſort ſtrongeſt, as they term it, and ſome valuing another ſort more highly, without being able to aſſign any ſatisfactory reaſon for the preference they give in either caſe. It is of importance that this matter ſhould be elucidated. Although it does not always happen, yet, in many parts of the country, the real nature of lime is ſo little underſtood, that the weightieſt lime is preferred as a manure to that which is lighter; becauſe it is imagined the firſt has more ſubſtance, and will therefore produce a more powerful effect upon ground than the fineſt and lighteſt lime. But there ſeems to be no reaſon to think there is any difference in the ſpecific gravity of different parcels of pure calcareous matter when fully calcined; therefore, if there is any difference in the weight of various ſorts of lime, it muſt ariſe entirely from a variation in the quantity or gravity of ſome extraneous matter that is mixed with the lime; and as ſand is almoſt the only extraneous body that is ever found in lime-ſtone, and is always of much greater ſpecific gravity than pure quick-lime, it follows, that the weighty lime only owes its ſuperior gravity to a larger proportion of ſand that is mixed with it. But ſand is of no value as a manure; ſo that he who voluntarily purchaſes this kind of lime in preference to the other is guilty of a great degree of folly; which will be the greater if he has likewiſe to drive it from a conſiderable diſtance.

However, thoſe farmers who have acceſs to only one ſort of lime-ſtone, muſt be contented with it, whatever may be its quality. But ſuch as have an opportunity of chooſing may be benefited by the obſervation, that pure lime-ſtone, when fully calcined and ſlaked, is reduced to a fine white impalpable powder that feels ſoft between the fingers, without the ſmalleſt tendency to grittineſs; while ſuch lime as contains ſand is never ſo fine nor ſo ſoft, but feels gritty when rubbed between the fingers. See Anderſon's Eſſays.

Action, Quantity, and Application of Lime.—The author of Modern Agriculture remarks, that there are few diſtricts where lime is not either in general uſe, or partially introduced as a manure. With reſpect to the uſe of lime, or the benefit derived from it as a mean of fertilizing the ſoil, ſome are of opinion that it promotes vegetation, by ſtimulating, or forcing the ſoil with which it is incorporated to exert itſelf: others imagine it promotes vegetation by enriching the ſoil, and thereby adding to the quantity of vegetable food. Various other opinions, different from theſe, and in ſome inſtances oppoſite to each other, have been entertained reſpecting the manner in which lime operates upon land; but all that we yet know with certainty on the ſubject, is collected from practice and experience, whereby it is proved that lime ſomehow or other operates ſo as frequently to produce luxuriant crops on ſoils which, before the application of that manure, were comparatively of little value; and farther, that on all ſoils which are treated properly after being thoroughly limed, its beneficial effects are diſcernible by the moſt curſory obſerver. Various other modes in which this ſubſtance may be uſeful as a manure, may be ſeen under the terms *Calcareous* EARTH, and PHOSPHORUS.

The proportion or quantity of lime applied to the acre ſeems hitherto, the ſame writer obſerves, fixed by no certain rule, either in regard to the nature of the different ſoils, the modes

modes of cropping afterwards adopted, or the ſuperior quality of one kind of lime-ſtone beyond another.

It has been remarked, that ſome require that it ſhould be applied in ſuch ſmall quantities as thirty or forty buſhels to the acre; and aver, that if more is uſed the ground will be abſolutely ruined; while others maintain, that ten times that quantity may be applied with ſafety. A great variation may no doubt be produced, in this reſpect, by a difference in the nature of the ſoil, in the ſtate of culture it is under at the time, in the quantity of calcareous matter with which it may have been formerly impregnated; and perhaps a variation may ſometimes ariſe from other circumſtances that have never yet been attended to. A difference will likewiſe ariſe from the quality of the lime that is applied, and from the manner in which it is employed, ſome kinds of lime containing, perhaps, ten times more calcareous matter than others: and a very great difference may proceed from the mode of applying the lime itſelf. For it is common to hear thoſe who have had little experience of lime as a manure, recommend very great caution, leſt too great a quantity be employed, for fear of burning the ſoil, as they expreſs it. This idea of burning has been evidently adopted from what is experienced by applying cauſtic lime to animals or vegetables in large quantities, as it often corrodes and ſhrivels them up, and produces other effects, which greatly reſemble thoſe of fire; but it cannot produce any ſuch effects, unleſs there are vegetables growing upon the ſoil at the time. In that caſe the vegetables might indeed be corroded by the lime, if rain ſhould fall immediately after it was ſpread when newly ſlaked; but as it loſes this fiery corroſive power in a few days after it is ſpread, nothing of that kind can be expected to happen to the ſoil. Accordingly, we never hear of crops being burnt up with too great a quantity of lime in thoſe counties where it has long been uſed as a common manure, although it is there often employed in much larger quantities than in other places where it is more rare. The writer has himſelf had the experience of lime in all proportions, from one hundred to above ſeven hundred buſhels to the acre, upon a great variety of ſoils; and has always found that its effect in promoting the fertility of the ſoil has been in proportion to the quantity employed, other circumſtances being alike. The expence, in moſt caſes, prevents farmers from employing this manure in greater quantities than thoſe above-mentioned; but accidental circumſtances clearly ſhew, that if it were applied in much larger quantities, the effect would only be to promote the luxuriance of the crop in a higher degree. A gentleman of his acquaintance, in whoſe veracity he can confide, happening to be from home when a large field was limed, and having no occaſion for the whole quantity of lime that had been brought for that purpoſe, and laid down in one corner of the field, his ſervants, without driving it away, mixed what remained with the ſoil, although the lime lay there about four inches thick over the whole ſurface. The effect was, that for many years afterwards, the grain in that place was ſo immoderately luxuriant, that it fell over, and rotted before it came to the ear. After many years this luxuriance abated a little, ſo as to allow the grain to ripen; but it was there always much more luxuriant than in any other part of the field. An accidental experiment, nearly ſimilar to this, fell under his own obſervation. It happened that the ſervants of another farmer laid, by miſtake, a few heaps of lime upon a graſs field that he did not intend ſhould be broken up at the time. The miſtake was ſoon diſcovered, and no more lime was laid down at that place; and the few heaps (about a buſhel in each) were allowed to lie neglected, without being ſpread. The field was paſtured upon for ſeven or eight years after that, before it was converted into tillage; and the heaps were by that time become ſo flat, and ſo far ſunk into the ground, that they could hardly be diſcovered. Before it was ploughed up, the whole of the field was limed, and this part of it equally ſo with the reſt; nor were the old heaps touched till the plough went through them in tilling the field, when the lime was there turned up, with only a very ſmall mixture of ſoil. The conſequence was, that at every one of theſe heaps, a tuft of corn ſprung up with ſuch luxuriance as to be entirely rotted before harveſt; and for many years afterwards, theſe tufts could be diſtinguiſhed from the other part of the field at a very great diſtance, like ſo many buttons on a coat; and perhaps continue ſo to this day. From theſe experiments, as well as other conſiderations, there ſeems to be reaſon to conclude, that on ſoils which do not naturally abound with chalk, or other calcareous matter, there is leſs danger in giving too much lime than in applying too little, except in thoſe caſes where an over luxuriance is to be apprehended previouſly to ſuch limings.

It has been ſtated by a late agricultural writer, that in the counties of Lanark and Weſtmoreland, from one hundred to five hundred buſhels of lime-ſhells, after being reduced to powder, are applied to the Engliſh ſtatute acre; and that the buſhel of lime-ſhells, or calcined lime-ſtone, generally yields from two and a half to three buſhels of powdered lime; the price of which at the kilns varies from fourpence to ſixpence; the general average over the kingdom being rated at fourpence halfpenny the buſhel. In the county of Nottingham, the ordinary quantity does not exceed ſeventy or eighty buſhels. In the counties of Cumberland in England, and Weſt Lothian, Fife, Perth, Angus, Mearns, &c. in Scotland, from one hundred to one hundred and fifty buſhels is the uſual quantity; and this laſt may be ſtated as the general average quantity commonly uſed in all the other parts of the iſland.

It is aſſerted to have been often heard urged as an objection to the uſe of lime as a manure, that although it does indeed promote the fertility of a ſoil in a higher degree at firſt, yet, in the end, it renders it much more ſterile than formerly; on which account, they ſay, it ought not to be at all employed. This, like many other objections to uſeful practices, takes its riſe entirely from the avarice and unſkilfulneſs of thoſe who complain. It is chiefly heard of in thoſe parts of the country where it is not common for a farmer, after once liming a poor ſoil, to take fifteen or ſixteen crops of oats ſucceſſively, without any other dreſſing or alteration of crops. It muſt be a good manure that enables theſe ſoils to produce ſuch a number of ſucceſſive ſcourging crops of any ſort: but it would be a marvellous one indeed, if it ſhould prevent thoſe fields being exhauſted by them. But is it not well known, that in all the richeſt and beſt improved parts of the country, lime has been long employed as a manure? Yet, ſo far are thoſe ſoils from being rendered ſterile by it, that it is doubtful if any art, without the aſſiſtance of lime, or ſome calcareous matter, could ever have brought theſe fields to their preſent degree of fertility. Thoſe, therefore, who complain of the hurtful effects of lime as a manure, proclaim what they ought to conceal; that they have had in their poſſeſſion a treaſure, which might have enriched their poſterity, but which in their own life-time they have idly ſquandered away.

We are, however, not only unacquainted with the mode in which the lime operates upon the ſoil, but we are even in a great meaſure ignorant of the actual changes that are produced upon the earth after this manure is applied. It is often aſked, How long the effects of lime may be perceived on the ſoil? And, if by this queſtion it be meant to aſcertain the length of time that the effects of lime will be perceptible in promoting the luxuriance of the crop after one manuring, it is no wonder that very different anſwers ſhould be given, as the effects muſt vary with the quantity or quality of the lime employed, the nature of the crops that follow, and many other circumſtances, which it would be impoſſible to enumerate. But if it be viewed in another light; if lime be ſuppoſed to alter the ſoil, ſo as to render it ſuſceptible of being affected by other manures in a more ſenſible degree, ſo as to make it capable of producing crops that no art could otherwiſe have effected, and to admit of being improved by modes of culture that would not otherwiſe have produced any ſenſible benefit, the anſwer to the queſtion would be more eaſy, as in this light, it is pretty plain that its effects will be felt, perhaps, as long as the ſoil exiſts. It is believed farmers are ſeldom accuſtomed to conſider lime, or other calcareous manures, in this point of view; although, when it comes to be inquired into, it is not doubted but this will be found to be by far the moſt valuable effect of theſe meaſures. A few facts will beſt illuſtrate the meaning. In Derbyſhire the farmers have found, that by ſpreading lime in conſiderable quantities upon the ſurface of their heathy moors, after a few years the heath diſappears, and the whole ſurface becomes covered with a fine pile of graſs, conſiſting of white clover, and the other valuable ſorts of paſture graſſes. This ſhews that lime renders the ſoil unfriendly to the growth of heath, and friendly to that of clover. It is found by experience, that in all porous ſoils which are not expoſed to too much dampneſs, in every part of Scotland where lime has not been employed, heath has a natural and almoſt irreſiſtible propenſity to eſtabliſh itſelf. In thoſe parts of the country where lime has been much uſed as a manure, we find that the fields may be allowed to remain long in graſs, without becoming covered with that noxious plant. Again, it is well known by thoſe who have been attentive, and have had opportunities of obſerving the fact, that peas of any ſort can never be ſucceſsfully cultivated in any part of the country where the ſoil is not of a very ſtrong clayey nature, or where lime or other calcareous manures have never been employed. If the ground be made as rich as poſſible with common dung, although the peas in that caſe will vegetate, and grow for ſome time with vigour; yet, before they begin to ripen, they become blighted, uſually die away entirely before the pod is formed, and but rarely produce a few half-formed peas. But if the ground has ever been limed, although, perhaps, at the diſtance of thouſands of years before that period, it never loſes its power of producing good crops of peas, if it is put in a proper tilth for carrying them at the time. Again, in countries that have never been limed, the kinds of graſs that ſpontaneouſly appear, if left to themſelves, are the ſmall bent-graſs and feather-graſs. In places where lime has ever been uſed, the ground, if exhauſted, produces fewer plants of theſe graſſes; but in their ſtead white clover, the poa and feſcue graſſes, chiefly abound. The ſoil in either of theſe caſes may become equally poor; that is, may produce equally ſcanty crops: but the means of recovering them will be ſomewhat different. In the laſt caſe, a fallow ſeldom fails to prove beneficial. In the firſt, it is often of no effect, ſometimes even hurtful. In the laſt, a moderate dreſſing of dung produces a much more ſenſible and laſting effect than in the other. In the laſt the quality of the graſs, as well as its quantity, rather improves by age. In the firſt theſe circumſtances are reverſed. Several other obſervations might be made, tending to ſhew that ground, which has been once impregnated with calcareous matter, acquires qualities from that moment which it did not poſſeſs before, which it ever afterwards retains, and never returns exactly to its former ſtate. In addition to this it is obſerved, that although lime has ſuch powerful effects on the ſoil, it does not ſeem ever to incorporate with the mould, ſo as to form one homogeneous maſs; but the lime remains always in detached particles, which are larger or ſmaller in proportion as it has been more or leſs perfectly divided when it was ſpread, or broken down by the ſubſequent mechanical operations the ſoil may have been made to undergo. Hence it happens, that in ploughing, if there chance to be any lumps of calcareous matter in a dry ſtate upon the ſurface, they naturally tumble into the bottom of the open furrow as ſoon as the earth is edged up upon the mould-board, ſo as to fall into the loweſt place that has been made by the plough before the furrow-ſlice is fairly turned over. In conſequence of this circumſtance, it muſt often happen that, in the courſe of many repeated ploughings, more of the lime will be accumulated at the bottom of the ſoil than in any other part of it; and as the plough ſometimes goes a little deeper than ordinary, the lime that on theſe occaſions chances to be depoſited in the bottom of theſe furrows, will be below the ordinary ſtaple of the ſoil, it will be uſeleſs for the purpoſes of the farmer. It is commonly thought that the lime has ſunk through the ſoil by its own gravity, although it is certain that lime is ſpecifically lighter than any ſoil, and can only be accumulated at the bottom of the mould by the means above deſcribed: others think that the lime is chemically diſſolved, and afterwards depoſited there; but this idea is not corroborated by the facts that have been already brought to notice. The following directions are applicable in either caſe. To obviate this inconvenience, it behoves the farmer, in the firſt place, to be extremely attentive to have his lime divided into as ſmall particles as poſſible at the time of ſpreading; for, if theſe are ſufficiently ſmall, they incorporate ſo intimately with the mould, as to be incapable of being eaſily detached from it. On this account, as well as others, it is always moſt adviſable to ſpread the lime when in its dry powdery ſtate, immediately after ſlaking, before it has had time to run into lumps. It is alſo of importance to plough the ſoil with a more ſhallow furrow than uſual when lime is put upon it, eſpecially the firſt time it is ploughed after the lime has been ſpread upon its ſurface; becauſe, at that ploughing, the lime being all on the ſurface, a larger proportion of it is turned into the bottom of the laſt made furrow than at any ſucceeding ploughing; and therefore more of it will be buried beneath the ſtaple than at any other time, if the furrow ſhall have been very deep. This circumſtance becomes more eſſentially neceſſary in ploughing graſs-ground that has been newly limed; becauſe, in this caſe, the lime is leſs capable of being mixed with any part of the ſoil than in any other. It alſo becomes extremely neceſſary, in all ſucceeding times, to guard as much as poſſible againſt ploughing to unequal depths. See Anderſon's Eſſays.

In the work on the preſent ſtate of huſbandry in Great Britain, it is ſuggeſted as probable, that the propriety or impropriety of repeated limings depend more on the nature of the ſoil, and the modes of management afterwards adopted, than on any other circumſtance connected with it; and that, as in ſome diſtricts it is repeated two or three times in the courſe of twenty years, while in others a repetition of liming, except in mixture with other ſubſtances, is found injurious, it is impoſſible to account for ſuch variations in the practice or its effects on the ſoil, without obſerving, in the firſt place, that although there has been as yet no general rule eſtabliſhed, by which a farmer can determine what quantity of lime is beſt ſuited to a particular ſoil, yet in practice, a greater quantity is laid on ſtrong, denſe, ſtubborn ſoils, than on thoſe of a more friable nature. In the ſecond place, that the diverſity of meaſures by which lime is ſold at the different kilns, is often ſo great, as to leave it doubtful whether a farmer in one part of the iſland, who applies three chaldrons to the acre, does not uſe leſs than he who, in another diſtrict, applies two. And in the third place, that the quality of lime-ſhells is ſo extremely different, that in ſome caſes the farmer who lays five chaldrons on the acre, does not apply a greater quantity of effective manure than another who limes an acre with three only. And from various circumſtances which have been already noticed, in ſpeaking of calcareous earth, as well as from the great and general advantage of this ſubſtance on all ſoils and ſituations, except ſuch as are previouſly replete with calcareous matter, or too moiſt, the writer of the "Philoſophy of Agriculture" conceives, that its effects can only be underſtood from the idea of its actually ſupplying the nutrition of vegetables. This is ſtill further confirmed, by its contributing ſo much to the amelioration of the crops, as well as to their increaſe in quantity, as noticed by millers and bakers. If it be applied in a large quantity, it likewiſe kills animals in the ſoils, and alſo ſmall vegetables, and from the deſtroyed and decayed animals and vegetables, the ſoil is rendered more fertile, by being impregnated with mucilage. The ſuperabundant lime is uſeful as it becomes mild calcareous earth, by attracting carbonic acid from the atmoſphere, and afterwards gradually affording it to plants. By the fermentation it brings on, and the fineneſs of its particles, the texture of the earth is opened and divided.

It is evident that light ſandy lands, containing only a ſmall portion of vegetable matter, ſhould not be overdone with lime, unleſs we can aſſiſt them liberally with animal manures. Its great excellence on a ſandy ſoil is its mechanically binding the looſe particles, and preventing the different parts of the manure from eſcaping out of the reach of the crop. On clay, by means of the gentle fermentation which lime produces, the ſtubborn ſoil is opened; the manure readily comes into contact with every part of it, and the fibres of the plants have full liberty to ſpread. It is often ſaid that lime anſwers better upon ſand than clay; but let the farmer treble the quantity, and he will be convinced that lime is better for clay than ſand. Clay well limed becomes a marle, falling in water, and fermenting with acids: the air, rain, and dews are freely admitted, and the ſoil retains the nouriſhment of each. In conſequence of a fermentation raiſed in the ſoil, the fixed air is ſet at liberty, which in a wonderful manner promotes vegetation. It is the nature of lime, in its active ſtate, to diſſolve vegetable bodies. Upon this principle we may account for the wonderful effects it produces in the improvement of black moor-land, which conſiſts of diſſolved and half diſſolved vegetable ſubſtances. And it may be obſerved in general, that the greateſt quantity ſhould be uſed upon the deepeſt and richeſt ſoils, and the leaſt upon thoſe that are thin and light. On ſtrong clays and deep loams there is a ſubſtantial body for it to operate upon; conſequently, a conſiderable quantity will be required to pervade and give due activity to the whole; but as the ſoil is lighter, the quantity muſt be leſs, and the after-management in regard to crops extremely cautious. In liming a ſingle field, an attention to the quantity will often be found neceſſary: the ſoil of the higher parts being for the moſt part light and free, and that of the lower more deep and compact, where the ground is unequal. On ſome ſoils, particularly where the bottom is chalk, lime-ſtone, or marle, lime will be pernicious, eſpecially if the ſoil be thin.

Whatever be the method in which lime produces its beneficial effects upon land, it ſhould always be reduced into as fine a powder as poſſible, and ſpread out with the greateſt equality upon the ſoil, as by theſe means it will be more equally blended with it, and be more extenſively uſeful in promoting the growth of crops.

Conſidering lime as a ſubſtance operating upon the living ſubſtances in the ſoil, as well as mechanically upon the ſoil itſelf, we perceive the neceſſity of applying a ſufficient quantity at once, in order to produce theſe effects: for, if the quantity employed be ſmall, and the ſoil deep, its effects will be ſcarcely perceived. Many farmers imagine that lime will not anſwer upon their lands, becauſe they have laid it on in ſmall quantities, whereas in all probability they would have found a larger doſe highly beneficial. On clay, four or five hundred buſhels are laid on for wheat, but it can ſcarcely be expected to anſwer the expence. On moſs, bog, moor, &c. to be reclaimed from a ſtate of nature, the more is laid on the better it is. The beneficial effect of lime on ſandy land may be explained from its binding quality. But when ſuch lands are firſt broken up from their ſtate of heath, the vegetable matter is acted upon and reduced to manure by the corroſive power of the lime. On ſuch lands, the firſt crop of rye has more than paid the expences. By attracting water, lime has a tendency to lay land dry. By inſinuating itſelf between the particles of clay, it deſtroys their adheſions, breaks the ſtiffneſs of the ſoil, and gives readier acceſs to the operation of manures, and to the extenſion of the growing roots of plants. By attracting carbonic acid, or fixed air and water, and by its corroſive properties, it deſtroys the texture of bodies, and reduces vegetable matter to a ſtate of manure. It unites ſtrongly with oils, and renders them miſcible with water. By being deſtructive to inſects and vermin, it may alſo contribute to preſerve the ſpringing corn from their ravages.

Dr. Anderſon, however, ſuggeſts, that, from writers on agriculture having long been in the cuſtom of dividing manures into two claſſes, *viz.* enriching manures, or thoſe that tended directly to render the ſoil more prolific, however ſterile it may be, among the foremoſt of which was reckoned dung; and exciting manures, or thoſe that were ſuppoſed to have a tendency to render the ſoil more prolific, merely by acting upon thoſe enriching manures that had been formerly in the ſoil, and giving them a new ſtimulus, ſo as to enable them to operate anew upon that ſoil which they had formerly fertilized: in which claſs of ſtimulating manures lime was always allowed to hold the foremoſt rank; it would follow, that lime could only be of uſe as a manure when applied to rich ſoils; and, when applied to poor ſoils, would produce hardly any, or even perhaps hurtful effects. He acknowledges that he was ſo far impoſed upon by the beauty of this theory, as to be hurried along with the general current of mankind, in the firm perſuaſion of the truth of the obſervation, and for many years did not ſufficiently advert to thoſe facts that were daily occurring to contradict it. He is now, however, firmly convinced, from repeated obſervations, that lime and other calcareous manures produce a much greater proportional improvement upon poor ſoils than on ſuch as are richer; and that lime alone, upon a poor ſoil, will, in many caſes, produce a much greater and more laſting degree of fertility than dung alone. In direct contradiction to the theory it is added, that he never yet met with a poor ſoil in its natural ſtate, which was not benefited in a very great degree by calcareous matters, when adminiſtered in proper quantities. But he has met with ſeveral rich ſoils that were fully impregnated with dung, and therefore exactly in that ſtate in which the theory ſuppoſes that lime would produce the greateſt effect,—but upon which lime, applied in any quantities, produced not the ſmalleſt ſenſible effect.

The author of Phytologia ſuggeſts the idea of its ſupplying actual nutrition to vegetables, which ſeems probable, as it contributes ſo much to the melioration of the crops, as well as to their increaſe in quantity—wheat from land well limed being believed by farmers, millers, and bakers, to be, as they ſuppoſe, thinner ſkinned: that is, to turn out more and better flour; which it is ſuppoſed is owing to its containing more ſtarch and leſs mucilage. Hence is perceived another very important uſe of lime in the cultivation of land, which may be owing to its forwarding the converſion of mucilage into ſtarch, that is, to its forwarding the ripening of the ſeed, which is a matter of great conſequence in this climate of ſhort and cold ſummers. Mr. Young, from various minutes made in his Eaſtern Tour, concludes, that lime agrees with almoſt all ſoils; that it fails, however, on a thin loam or lime-ſtone; that it ſeems inefficacious on old paſture; that it has a ſtrong effect in killing weeds; but that the greateſt effect is on heath and moor-lands; where, as in the peak of Derbyſhire, it converts waſte ſoils into fine paſtures, without tillage: but the ſort is a ſtrong ſtone lime, burning ſoft and ſoapy, and the quantity laid on is very great, riſing to three hundred and ſixty or even one thouſand buſhels. There is great reaſon to attribute much of the benefit to quantity: in waſtes eſpecially, too much can hardly be laid on, becauſe diſſolving the roots of heath and other ſpontaneous growth requires a powerful agent. Of their ſtrong lime three hundred and ſixty buſhels are probably equal to five or ſix hundred buſhels of chalk lime. What then are five or ſix quarters, which is no uncommon quantity, laid upon an acre?

And the mode of uſing lime, in improving their heaths or moors, is firſt to pare the ground in the beginning of March, about an inch and a half thick, to turn it about in dry weather, when dry to gather it into heaps, and burn it into aſhes, to ſpread them even over the ground, to ſet on their lime, to ſpread and harrow it altogether, to plough the ground very thin, and to ſow it with turnips or rape; then the ſpring following to ſow with oats or barley, and good graſs ſeeds: another good dreſſing with lime after the firſt crops of ſeeds is got; and then it may lie for paſture. Spreading the lime in a ſlaked ſtate is by far the beſt method. The ſummer months are preferred, becauſe fewer coals are neceſſary for burning; in other reſpects, the winter months are juſt as good for laying the lime upon the ground, provided it be done in dry weather.

But in its application upon fallows it is found to produce the beſt effects when laid on early in the ſeaſon, and well incorporated with the ſoil while it is dry and powdery.

And the aſſiſtance of this manure has been highly uſeful in the cultivation of turnips; whole diſtricts, formerly uſeleſs, having been made to produce not only good crops of them, but alſo valuable ones of corn and broad clover. Its greateſt utility would ſeem to be upon light ſoils for theſe crops; as, where lime is the principal manure, they ſeldom ſow turnips, clovers, peas or beans, except upon lands that have been previouſly limed. Inſtances of this ſort are often met with upon the uplands; where, if any of the broad-leaved crops are ſown, where a part has been limed, and a part not, the parts where the lime has been laid will produce, it is ſaid, a valuable return, while that which has been dunged only will hardly repay the expence of ſeed and labour. The methods of uſing lime upon turnip-lands are various. Some farmers lay it on only before the laſt ploughing, and plough it in without harrowing: they alſo lay it in heaps, hot from the kiln, without being ſlaked. But probably the ſooner it is laid upon the land, and the more perfectly it is mixed and incorporated with the ſoil before the ſeed is ſown, the more certain and extenſive will its effects be found.

But the application of this ſubſtance upon clover-ley for oats is a mode of practice which ought not to be attempted. It is generally laid on in this way in the autumn, and ploughed down in the ſpring, but the crops ſeldom repay the expence.

This ſubſtance is alſo uſed as a top-dreſſing in ſpring upon graſs, or wheat and other grain; but upon the latter it is ſaid to be dangerous, unleſs the lime be made into a compoſt with dung or earth; in this form it will not only be ſafe but highly uſeful, except upon coarſe meadows abounding with ruſhes, and other trumpery, which it deſtroys by abſorbing the ſuperabundant moiſture which ſupports them.

But upon light ſoils, if ſeveral white crops be taken in ſucceſſion after liming, the land will be worn out; a white and green crop ſhould be taken alternately. Upon clay lands a ſummer fallow is ſometimes indiſpenſable; in that caſe the lime ſhould be laid on in July or Auguſt, and completely harrowed in before ploughing: two or three ploughings at leaſt are required to incorporate it well with the ſoil, and a ſuitable harrowing after each ſhould likewiſe be given.

However, about Perth in Scotland, according to the Report of that county, the quantity laid on ſtiff land, by ſkilful improvers in the low country, is from forty to fifty bolls to the acre; on light land, with a gravelly ſubſoil, thirty or thirty-five bolls are accounted a ſufficient doſe. In ſome parts of the carſe or clay land, which is not eaſily ſtimulated, they lay on eighty or ninety bolls. It is ſometimes laid on fallows, immediately before the ſeed furrow; on barley and graſs ſeeds, either before or after the barley is ſown; and in ſome caſes with the preceding crop, where turnips are cultivated, to prepare the ground for barley. Lime is in ſome inſtances mixed in compoſt dung-hills, in others it is ſpread on the green ſward, before the land be broken up from graſs. One infallible maxim with regard to lime is, that the longer it is kept near the ſurface, at leaſt within reach of the plough, until it be intimately mixed with the ſoil, and its virtues imbibed, ſo much the better. The firſt liming of land has always a more powerful effect than it has at a future but no diſtant period, the quantity being equal. Quick lime intended for wheat, after a fallow, or for barley and graſs ſeeds, might be ploughed in with a very ſhallow furrow, before the ſeed is ſown: for oats after ley, it ought to be laid on during the preceding autumn; and for paſture or a top-dreſſing, early in the ſpring or autumn, rather than in ſummer or in winter; becauſe, if the ſummer be dry, the graſs is burnt up by the lime, and in winter its virtues are leſſened by the froſt, nor does it ſo powerfully attract the influence of the air. It is common, but perhaps difficult to be accounted for, when lime is ſpread on ſhort heath or other barren ground, which has a dry bottom, to ſee white clover and daiſies riſing ſpontaneouſly and plentifully, the ſecond or third ſpring afterwards, where not a veſtige of either, nor even a blade of graſs, could be diſcovered before it was applied. Dr. Darwin remarks that he has been informed, that if a ſpadeful of lime be thrown on a tuſſock, which horſes or cattle have refuſed to eat for years, they will for many ſucceeding ſeaſons eat it quite cloſe to the ground; which is owing, he ſuſpects, to the graſs containing more ſugar in its joints, or to the leſs acidity of all its juices.

Where lime is to lie in a heap for any length of time, it ſhould be covered with earth, to preſerve it from the air and rain. It has been obſerved, that the benefit of lime is not apparent in a dry ſummer, and that it does not act fully as a manure, till it has been thoroughly ſlaked in the ſoil, by continued rains. In Eſſex an excellent practice prevails, of forming a compoſt of lime, turf, and ditch earth, at the gate of every field, ready to be applied as a manure when wanted. Twenty buſhels of lime mixed with forty buſhels of ſand form an excellent top-dreſſing for an acre of wheat, if laid on early in the ſpring. But lime, as firſt noticed, is apt to ſubſide beyond the depth of the common furrow; deep ploughing in this caſe is the only remedy applicable. In ſome midland counties a fallow is ſeldom made without being dreſſed with lime, under an idea that it mellows the ſoil, and makes it work well, while in tillage; and ſweetens or improves the quality of the herbage when laid down to graſs. For this purpoſe it is fetched eighteen or twenty miles. And two ſorts of lime are in uſe in ſome diſtricts, as about Derby. The Breedon lime, burnt from a very hard ſtone, and of ſingular ſtrength as manure; and the common lime, burnt from common ſtones, and called Ticknall or Walſal lime. The load-heaps are generally watered as they are thrown down from the waggon; and always turned over to complete the falling more effectually. If a quantity of lime be fetched in autumn or early in winter, to be uſed in the ſpring, when team-labour is more valuable, it is thrown up into a regular roof-like heap or mound, and thatched as a ſtack; a ſmall trench being cut round the ſkirts to catch, with an outlet to convey away, rain water. Thus the heap is prevented from running to a mortar-like conſiſtence by the ſnows and rains of winter, and thereby rendered more uſeful as manure.

In the Rural Economy of the Midland Counties it is noticed, that a turnip fallow was manured with Breedon lime, in general five quarters to an acre; part had double that quantity, and part had none. The turnip crop received no obvious advantage, but its effects on the barley were evident. The part not limed was the worſe crop, nearly in the proportion of four to three. But the part limed with ten quarters to an acre was the beſt crop. Whence the common notion, that more than five quarters of Breedon lime to an acre is ruinous to crops, ſeems to be ill founded. And in the Economy of Norfolk, lime is ſaid to be in good repute, though not in general uſe as a manure; different opinions being entertained reſpecting the value of it. This difference of opinion will ever remain, while general concluſions are drawn from particular incidents. It is uſed by many judicious farmers, even after marle, with ſucceſs. Upon hot burning ſoils it is generally found of the greateſt efficacy, and is perhaps the moſt effectual cure of ſcalds or burning patches of land that has yet been diſcovered; from theſe and other circumſtances lime is there conſidered as a cold manure. The general method of applying lime is to let it fall in large heaps, and to ſpread it out of carts upon fallowed ground either for wheat or barley. The quantity ſet on is about three chaldrons an acre; the price 9*s*. or 10*s*. a chaldron. (Now much higher.) From experiments made on turnips, barley, and wheat, it appears that lime does not act as a manure until it has been thoroughly ſlaked in the ſoil; and it ſeems as if the rains of ſummer were neceſſary to promote its operation. But in ſome parts of Yorkſhire lime is uſed invariably on every ſpecies of ſoil; and in moſt caſes with great ſucceſs. On the higher and more dry lands its utility is evident. At Malton it is laid on the calcareous quarry ſoil with ſucceſs. Its uſe to the looſe ſandy ſoils is fully eſtabliſhed. The prevailing crop is wheat on fallow. It is alſo pretty generally ſet on for rape, turnips, or other crops, after ſod-burning, and ſpread among the aſhes. It is alſo ſometimes ſet on for barley. But its effect on the firſt crop, except of wheat or rape, is ſeldom perceptible.

But the benefit of lime to graſs is a matter of diſpute; it is even thought by ſome to be detrimental. It ſeems, however, to be a generally received idea, that lime laid on graſs is not thrown away; for, whenever the land is turned up again, its benefit to corn will have full effect. The methods of liming are various. The worſt is laying it in large heaps, and ſuffering it to run to a jelly before it is ſpread. Next to this, is ſetting it about the land in ſmall hillocks; for, although they are ſpread before they approach to a ſtate of mortar, yet this method is injudicious. Lime falling in the open air breaks into ſmall cubical maſſes, which being once buried in the ſoil, remains in it for ages, without being mixed intimately with it. Lime ought therefore to be ſpread in a ſtate of perfect powder. It is therefore the practice of judicious huſbandmen to ſet lime upon the land in load-heaps, and ſpread it over the ſoil out of carts, as ſoon as it is ſufficiently fallen. Or the load-heaps are turned over, not ſo much to finiſh the falling, as to gain an opportunity of burying the granulous ſurface of the heaps; by which means, the fragments are at leaſt leſſened, if not reduced to powder. In the moor-lands the heaps are interlayered and covered up with moiſt turf or peat-mould, which bringing on a rapid fall, the whole is ſet on fire, and the ſurface kept free from granules by a covering of dry aſhes. The heaps, therefore, whether great or ſmall, ſhould be covered up with ſoil, either of the field they are ſet in, or that of lanes or ditches carried to them for the purpoſe; and if a ſpeedy fall be required, water thrown over this covering. If lime be uſed on fallows for wheat, it is generally ſpread in July, harrowed in as faſt as it is ſpread, and ploughed under with a ſhallow furrow, as ſoon as convenient. The uſual quantity is three or four chaldrons to an acre.

And “much depends upon the mode of applying the lime to the ſoil after calcination, according to Dr. Anderſon. If it is ſpread as ſoon as it is ſlaked, while yet in a powdery ſtate, a very ſmall quantity may be made to cover the whole ſurface of the ground, and to touch an exceedingly great number of particles of earth; but if it is ſuffered to lie for ſome time after ſlaking, and to get ſo much moiſture as to make it run into clods, or cake into large lumps, it can never be again divided into ſuch ſmall parts; and, therefore, a much greater quantity is neceſſary to produce the ſame effect, than if it had been applied in its powdery ſtate. But if the ſoil is afterwards to be continued long in tillage (as theſe clods are annually broken ſmaller by the action of the plough and harrows), the lime muſt continue to exert its influence anew upon the ſoil for a great courſe of years; it will produce an effect nearly ſimilar to that which would be experienced by annually ſtrewing a ſmall quantity of powdered lime over the ſurface of the ſoil; but as the lime muſt, in the firſt caſe, be paid by the farmer altogether at the beginning, which only comes to be ſucceſſively demanded in the other caſe, this deſerves to be attended to, as it may become a conſideration of ſome importance where lime is dear, and money not very plentiful.”

And it is conſtantly an object worthy of attention to remove the ſhells as ſoon as poſſible after the lime is drawn from the kiln; for it is known from experiment, that a ton of lime expoſed twenty-two days to the air after calcination, is augmented in weight to thirty hundred weight, and ſome kinds of lime even to thirty-five; which is little leſs than double.

In order to underſtand the goodneſs of lime, it is remarked by the ſame writer, that the lime from pure limeſtone is always of a bright white, when perfectly calcined without a tendency to any colour. When it has any colour it proceeds from the ſand, or other uncalcareous matters in its compoſition. There are, however, ſome ſorts of ſand that are of ſuch a pure whiteneſs, as not to debaſe the colour of the lime in the ſmalleſt degree; but theſe are rare; and there are ſome matters that alter the colour of the lime a good deal, without debaſing its quality in any conſiderable degree; but theſe are ſtill more rare than the former. Hence it follows, that the beſt lime for the purpoſe of the farmer, is that which is lighteſt, ſofteſt to the touch, and whiteſt. Softneſs to the touch is not, however, it is conceived, an unequivocal proof of the purity of the lime. He has ſeen one kind of lime that contained a large proportion of an uncalcareous impalpable powder, that was as ſoft to the touch as the pureſt lime; but this was a ſingular exception to the rule that is very general. The more they deviate from either of theſe teſts of purity, the worſe they are for the purpoſes of agriculture. But if the lime-ſtone loſes much of its weight in calcination, and the lime-ſhells are extremely light; if the ſhells require a very large proportion of water to ſlake them fully; if it is long before they begin to fall; if the lime-ſtone is not apt to run (or be vitrified) in the operation of burning; if it falls entirely when it gets a ſufficient quantity of water, after it has been properly calcined; if it ſwells very much in ſlaking, and if the lime is light, fine to the touch, and of a pure white, it may be concluded that it is extremely good, and may be uſed in preference to any other lime that is inferior to it in any of theſe reſpects. Theſe rules are perfectly ſufficient to decide as to the comparative value of any two kinds of lime that may be oppoſed to one another, and may be relied upon as ſufficiently accurate for the ordinary purpoſes of the farmer.

There are other methods by which the qualities or goodneſs of lime may be aſcertained with exactneſs, but which are beſt performed by an expert chemiſt.

Proper Seaſon for uſing Lime.—In reſpect to the moſt proper time of uſing lime to lands, there ſeems ſome difference of opinion among farmers, as well as to the ſtate in which it ſhould be uſed; ſome ſuppoſing the beſt time to lay it on dry ſoils intended for turnips, is in autumn, while others think the beginning of ſummer, as May and June, better. Some, likewiſe, contend that it ſhould be applied before it has been ſlaked; while others think it may be employed when even in a ſtate of conſiderable moiſture. The writer of the Farmer's Calendar, after putting the queſtion, whether lime burnt in January ſhould be then uſed or kept till ſpring, obſerves, that "there are two motives for burning ſtone or chalk; one is, for the ſake of reducing the material to powder, for accuracy in ſpreading; the other is, for the application of a cauſtic body deſtructive of living vegetables. For the former purpoſe, the lime had better be kept; for the latter, it is uſually laid on in ſuch large quantities, that it is not very material at what ſeaſon it is ſpread, provided it be done freſh from the kiln. It will have a greater effect in ſpring and ſummer, but the ſuperiority is not ſuch as to induce delay from a time in which the teams have little to perform, to a ſeaſon in which there is much work for them." And he further ſtates, that "the grand effect of this manure is on uncultivated waſte land. On moors, mountains, bog, and boggy bottoms, the effect is very great, but the quantity applied is conſiderable. The more the better. In Derbyſhire, as far as 600 buſhels an acre have been uſed; or 20 one-horſe cart loads of 30 buſhels: ſuch a dreſſing, when the ſpace to be improved is large, demands the employment of regular teams to be kept continually at work. In ſuch undertakings, it is idle to be nice about the ſeaſon of applying the manure; convenience demands that the work ſhould go on at all ſeaſons, but in the counties where lime is moſt uſed, the common ſeaſon is ſummer, and on fallows."

And there cannot be any doubt but that it is the beſt practice to apply it either in the ſpring, ſummer, or early part of the autumn, and in a ſtate as little moiſt as poſſible, as, under ſuch circumſtances, it may not only be laid on with the greateſt convenience, but be ſpread out in the moſt even and regular manner, which is a point of conſiderable importance in this huſbandry, and be laid on with leſs injury from treading the land, than could otherwiſe be the caſe.

The above writer alſo ſtates, that "liming is, in many diſtricts, connected with paring and burning, and it is one of the beſt methods of applying this manure. From a peck to a buſhel, according to its plenty, is added to, and mixed with, every heap of aſhes, and they are then ſpread together. The effect generally is conſiderable, but proportioned to the ſoil. The greateſt effect of this manure is upon land that has been long in a ſtate of nature; and particularly upon all peat ſoils, moors, mountains, and bogs. But upon all on which it is known to have effect, it is well applied in the aſhes of paring and burning."

But though the application of this ſubſtance properly belongs to the occupiers of lands, it is neceſſary that the proprietors of them ſhould render it as eaſy and convenient as poſſible, "either by ſearching for raw materials, opening quarries, and erecting kilns upon the eſtates under their care, or by bringing, from a diſtance, materials, fuel, or lime itſelf, at the leaſt poſſible expence, through the means of improved roads, rail-ways, or water-carriage." And that the ſame principle holds good "with reſpect to marles, and other groſs ſubſtances, to be uſed in their raw ſtate; as the advantages ariſing therefrom will always, eventually, find their way into the rent-roll."

Doctor Anderſon thinks it may be neceſſary to obſerve, that when farmers employ a great deal of lime, it ſometimes happens that their horſes' feet are burnt by it; which is extremely troubleſome, and ſometimes proves even fatal to the poor animals: a method of preventing or remedying that inconvenience will, therefore, be of uſe. The beſt method of preventing any inconvenience of this ſort is to ſpread the lime, when in its powdery ſtate, upon the field as evenly as poſſible, and to allow it to lie in that ſtate ſome time before you begin to plough it. If the lime has been in fine powder, it will have become perfectly effete in a week or ſo; after which time it will be as little corroſive as any kind of common earth, ſo that the horſes may work among it with perfect ſafety. But if it has been ſuffered to run into clods before it was ſpread, theſe, if not broken ſmall, will be longer in abſorbing their air, and, of conſequence, will remain longer in an acrid ſtate, ſo that the ploughing may, in that caſe, be deferred for a week longer, nor will it be even then ſo perfectly ſafe as the other. But if it becomes neceſſary at any time to plough in the lime immediately after it is ſpread, take care, ſays he, to do it only when the ſoil is perfectly dry, and in leading your horſes to the plough, take care to prevent them from going through any wet place, ſo as to wet their hoofs or ankles; for lime acts not at all upon any dry ſubſtance; but when it is in its acrid cauſtic ſtate, it will corrode the hair and fleſh in a moment, if it has acceſs to water. As ſoon as the horſes are unyoked, keep their feet dry till you have got them carefully bruſhed, ſo as to wipe away all the dry powdery lime that may adhere to them; and if the leaſt ſhower ſhould fall, unyoke your horſes immediately, and take them off the field. With theſe precautions, they may work among lime for any length of time, without receiving any damage whatever.

However, in caſe of any accident, by which a horſe or man that is working among lime ſhould be ſcalded by it, it is always adviſable for every farmer who has work of that kind going forward, to keep a tub of very ſour milk, or whey, in ſome place ready to waſh the part affected well with, which will quickly deſtroy the poignancy of the lime, and prevent the miſchief that would otherwiſe ariſe from it. The ſourer the milk or whey is, the better it will be for this purpoſe; it ought, therefore, to be long kept. For want of this, vinegar may produce the ſame effect, or very ſtale urine will be of uſe; but the milk or whey is the cheapeſt and beſt remedy, and ought always to be in readineſs where lime huſbandry is going on to any extent.

LIME, in *Botany*. See LEMON.

LIME-*Ammoniacal*, a kind of phoſphorus, invented by Mr. Homberg, and made of ſal ammoniac and lime. See *Ammoniacal* PHOSPHORUS, and LIME, *ſupra*.

LIME, *Bird*. See BIRD-*lime*.

LIME, *Brook*. See BROOK-*lime*.

LIME, *Burning*, a term ſignifying the proceſs of converting lime-ſtone, chalk, marble, ſhells, and other calcareous ſubſtances into lime, by means of heat, in kilns properly conſtructed for the purpoſe. See KILN.

In theſe caſes, the calcination is effected by different ſorts of fuel, in different ſituations, but principally by foſſil-coal, peats, or woods; theſe being laid in layers, alternately with thoſe of the calcareous materials, in the kilns, and the proceſs of burning continued for any length of time, by repeated applications of fuel and calcareous matters at the top, and drawing out the lime from below occaſionally as it is burnt.

But mineral coal, or culm, are unqueſtionably the moſt convenient and ſuitable materials for effecting this buſineſs, where they can be procured in plenty, and at a ſufficiently cheap rate, as they burn the ſtone, or other calcareous matter more perfectly, and, of courſe, leave fewer cores in the calcined pieces than when other ſorts of fuel are employed for the purpoſe.

However, Mr. Dodgſon has had much ſucceſs in burning lime by the uſe of peats; as he ſtates, in the Farmer's Magazine, that he is "convinced, from experience, that lime-ſtone can be burnt to better purpoſe, and at leſs expence, with peat than with coal. When coal is uſed, the lime-ſtones are apt, from exceſſive heat, to run into a ſolid lump, which never happens with peat, as it keeps them in an open ſtate, and admits the air freely. The proceſs of burning, alſo, goes on more ſlowly with coal. No lime can be drawn for two or three days; whereas, with peat, it may be drawn within twelve hours after fire is put to the kiln; and in every ſucceeding day nearly double the quantity of what could be produced by the uſe of coal. The expence is comparatively ſmall. A man and a boy will dig as many peats in one day as will burn 60 Carliſle buſhels of lime, (the Carliſle buſhel is equal to three Wincheſter ones,) and the expence, including drying, will not exceed four, or, at moſt, five ſhillings; while the coal neceſſary for burning the ſame quantity of lime would have coſt twelve ſhillings at the pit. The wetneſs of ſeaſons is no argument againſt the uſe of peats, as they can be ſtacked near the kiln, when half dry, at any time of ſummer; the moiſture will be exhaled from them during winter, and they will be in a fit ſtate for burning in the months of April or May. He lives in the north-eaſtern diſtrict of Cumberland, where the farmers, in general, burn their own lime; and though there is coal in the immediate neighbourhood, he gives a decided preference to peat, for the reaſons above-mentioned." And it is well known, that this kind of fuel has been occaſionally uſed in many parts of the kingdom for the ſame purpoſe, from a very early period, without any complaint of the want of ſucceſs.

In the practice here ſtated, no particular form of kiln was found neceſſary, nor any particular ſort of management in the proceſs of calcination; the proportion of peat depending upon the nature of the lime-ſtone employed, and other circumſtances.

It has been conſidered by Mr. Marſhall, that "the manufacture of lime is an art of which the manager of an eſtate ought not to be ignorant." And he conceives, that "he ought to have, at leaſt, a ſufficient knowledge of its theory, to enable him, when occaſion requires, to ſuperintend or direct its practice. For it ſeldom anſwers, unleſs where materials are plentiful and fuel cheap, for every tenant upon an eſtate to manufacture his own lime. A full-ſized kiln accumulates a ſtronger heat, with a given proportion of fuel, than a ſmall one of the ſame form," which is without doubt a great ſaving.

It is ſuppoſed, that "the chief or ſole intention of burning lime-ſtone for manure, appears to be that of reducing it in the readieſt and cheapeſt manner to an impalpable powder. For experience ſufficiently ſhews, that quick-lime is injurious, rather than beneficial, to vegetation; and that burnt lime-ſtone does not operate as a manure until it has regained the fixed air, of which the fire deprived it. If it could be reduced by mechanic powers to powder of equal fineneſs, its effect, as manure, would doubtleſsly be the ſame as that of dead lime (effete). It is in the perfect ſolution which well-burnt lime-ſtone has received, by the expulſion of its fixed air in the fire, ſo as to have completely looſened its texture, and unbound its every atom, that we are to look for its prompt effect and the ſhortneſs of its duration, comparatively with unburnt calcareous ſubſtances. Hence the main point to be attended to is to expel the whole of the air. For, unleſs this be accompliſhed, the ſolution becomes imperfect; the ſtones, inſtead of completely diſſolving into impalpable atoms, break into granules, or flakes; leaving, perhaps, a firm core in the centre, to encumber, rather than to fertilize, the ſoil" on which they are applied. "There is, however, an oppoſite extreme to be avoided, and with greater care. For an unburnt ſtone may be returned to the kiln, but one which, by too intenſe a heat, is vitrified, or changed to a ſtate of impure glaſs, is not only rendered uſeleſs, but has incurred an extraordinary waſte of fuel. Conſequently, ſtones that are prone to vitrification ought to be broken down into ſmall pieces; otherwiſe, the fire is required to be ſo intenſe, that the ſurface becomes vitrified, before the air from the centre can be expelled." And "another ſuggeſtion, reſpecting the proper ſize of the ſtones to be burnt, may have its uſe. Where fuel is weak, or dear, the materials require to be broken into ſmaller fragments, than where a ſtrong fire can be kept up at a ſmall expence; while, under the latter circumſtance, and where the ſtone is not prone to vitrification, much of the labour and expence of breaking may be ſaved, by uſing an extra quantity of fuel, and keeping up a ſtrong fire in the kiln," or place where it is burned; the form or conſtruction of which depends partly on the qualities and value of the materials, and partly on the kinds of fuel that are made uſe of, and the differences of their prices at the places where they are employed. See KILN.

It is uſeful that the proceſs of burning lime ſhould go on during January and February, as well as moſt of the winter, and alſo in the ſummer months. Perpetual kilns are wrought in many diſtricts, eſpecially the northern ones, and in Ireland; the lime, when not taken away, being preſerved, in ſheds erected for the purpoſe, from the wet. The uſual mode of managing with them is, for the farmers to contract for ſome ſort of meaſure, according to the cuſtom or practice of the particular diſtrict; being careful that it is well burnt, and of a proper quality in other reſpects. The differences in the expence of burning will depend on the abundance or ſcarcity of fuel, and the convenience of the ſtone for carriage.

LIME, *Calx*, *Calx viva*, in the *Materia Medica*, &c. is prepared by breaking a pound of lime-ſtone into ſmall pieces, and heating it in a crucible in a very ſtrong fire for an hour, or until the carbonic acid is entirely driven off, ſo that on the addition of the acetic acid, no bubbles of gas ſhall be extricated. Lime may be made by the ſame proceſs from ſhells previouſly waſhed in boiling water, and cleared from extraneous matters. In the former pharmacopeias lime was ranked among the articles of the Materia Medica, and taken as prepared for its uſes in the arts; but in the laſt London Pharmacopeia particular directions are given for obtaining it in a purer ſtate. Two varieties of the carbonate are ſelected from which it may be prepared, *viz.* lime-ſtone and ſhells of oyſters; the latter of which contains the leaſt foreign admixture; but even the former, thus prepared, will be much purer than that which is uſually made from chalk. According to Kirwan, carbonate of lime conſiſts of 45 parts of carbonic acid and 55 of lime: but from whatever combination it be obtained, lime is always the ſame ſubſtance, poſſeſſing the ſame characters, and producing the ſame effects, though it may be different with regard to the proportion of heterogeneous matters with which it is mixed; and, therefore, the diſtinctions which were formerly made between its medical qualities, as obtained from different ſources, were ſuperfluous, and will not, in the preſent ſtate of ſcience, be likely to be renewed by the introduction of more than one. To the perfection of the lime it is neceſſary that the carbonic acid ſhould be entirely expelled; but in the preparation of ordinary lime this is done very imperfectly; for to all common purpoſes it is ſufficient if it be burnt ſo as to ſlake on the addition of water; on the other hand, it may alſo be noticed that where lime-ſtone is employed, the heat may be urged too far and be too long continued. The pure earths will not vitrify by heat, but many earthy admixtures readily will; and as moſt lime-ſtones contain ſome portion of other earths, they may, under theſe circumſtances, vitrify, and form a coating over the ſurface of the lumps, which will defend them from the action of water, and thus prevent their ſlaking or ſolution; ſo that lime may thus be over-burnt. The pieces of ſtone uſed for burning ſhould be as nearly as poſſible of equal ſize. If half its weight of water be poured upon lime, it ſwells and falls into a white powder, much heat is evolved, part of the water riſes in ſteam, and part combines with the lime; this is called ſlaked lime, and in this ſtate carbonic acid from the air eaſily attaches to it. When perfectly dry it may be kept in bottles for any length of time without alteration; but to obviate any chance of its being impure from the above cauſe, it is uſual to direct its being employed newly prepared. Lime newly ſlaked, and to which more water is added, ought not to effervеſce on the addition of an acid.

Lime is much uſed by tanners, ſkinners, &c. in the preparation of their leather; by ſoap-boilers for diſſolving the oil, and facilitating its union with the alkaline ſalt; and by ſugar-bakers for refining their ſugar.

It is alſo of ſome medicinal uſe; being applied externally in deſiccative and epulotic medicines.

It is uſed alſo as a depilatory; and has been ſometimes made into an unguent with honey for rheumatic and other obſtinate fixed pains of the joints or limbs: this unguent is much commended by Fuller, who obſerves, that it is almoſt cauſtic. As an abſorbent earth, it is anti-acid, and capable of abſorbing the acid matters which are produced in digeſtion from the weakneſs of the ſtomach, in diſeaſes proceeding from a ſpontaneous acid, ſo well deſcribed by Boerhaave. It is the fitter in theſe diſeaſes, which are commonly the effect of the inactivity and weakneſs of the fibres, as it poſſeſſes a tonic quality, which other abſorbent earths have not. Beſides, perſons afflicted with theſe diſeaſes are ſubject to much wind, which is, perhaps, nothing elſe but gas; and quick lime is very capable of abſorbing that fluid. As quick-lime is alſo drying, a little cauſtic, and conſequently cicatriſing, it may contribute to cure certain ulcers, eſpecially thoſe of the ſoft parts. Accordingly, ſeveral able phyſicians have preſcribed it ſucceſsfully for internal ſuppurations, and in the phthiſis pulmonalis. Moreover, the property which quick-lime has of attenuating viſcid matters, and of decompoſing ammoniacal ſalts, has been advantageouſly applied to diſſolve ſtones in the bladder and kidneys. But the beſt method of adminiſtering quick-lime internally has been thought to be by giving the lime-water; becauſe this water is ſuppoſed to poſſeſs all the medicinal virtues of quick-lime, and becauſe the earthy particles are thus reduced to the greateſt fineneſs, and are, conſequently ſuſceptible of the moſt perfect diſtribution. However, this ſhould be adminiſtered with great caution, and much diluted; and, after all, it is doubted, whether the lime-water, thus diluted, has all the medical qualities which might be expected from quick-lime. Macquer.

LIME, *Carbonat of*, a term applied to lime when ſlaked or in the ſtate of lime-ſtone: when thus ſaturated it is in the leaſt active condition. See LIME *ſtone*.

LIME, *Cream of*. See CREAM.

LIME *Effete*, that which has been ſlaked by the air and moiſture of the atmoſphere after long expoſure.

LIME-*Galls*, in *Natural Hiſtory*, a ſort of galls or vegetable protuberances, formed on the edges of the leaves of the lime-tree in ſpring time; they are very common in the plantations of limes, and are irregularly ſhaped, but uſually oblong and rugged, and of a reddiſh colour; they occupy only the edges of the leaves, and are of a red colour, ſometimes very beautiful. As theſe are very plentiful, M. Reaumur was of opinion, that they might be of ſervice in the dyeing trade; he made trial by rubbing them on ſome parts of his linen, and found that they gave a very beautiful red colour, which did not come out in the firſt waſhings afterwards. It is extremely probable, that there wants only inquiry to prove that we have many valuable productions of this kind, which, though diſregarded at preſent, might prove of great uſe in the ſeveral mechanical arts as well as in medicine.

Theſe galls of the lime-leaves are formed by a worm, which inhabits them during its term of life, being found in them of all ſizes, from the moſt minute to that of the full growth, which is about half an inch in length; but when its period of life, as a worm, draws near, it deſerts this habitation, and goes elſewhere to paſs into its chryſalis ſtate. See GALLS.

Lime *Huſbandry*, a term uſed to ſignify that ſort of management which relates to the application of lime on land. See Lime.

Lime-*Kiln*, a ſort of kiln, conſtructed for the purpoſe of burning lime. Kilns of this nature are formed in a variety of different ways to ſave expence, and anſwer to the particular nature of the fuel. See Kiln.

Lime, *Quick*, a term applied to lime in its moſt powerful or cauſtic ſtate, before it has been rendered mild by the abſorption of carbonic acid gas, or fixed air, from either the atmoſphere or the ſoil.

Lime-*ſtone*, in *Agriculture*, a kind of calcareous ſtone, which is capable of being converted into lime by means of calcination. It would ſeem from the remarks that have been already made, in ſpeaking of the nature of lime, that this ſort of ſtone exiſts in different ſtates of purity, and conſiſts of different ſorts of ſubſtances in different ſituations, from which much diverſity in its effects, when converted into lime, is produced; ſome ſorts being more proper for the purpoſes of agriculture, while others are better adapted to thoſe of building, &c. See Lime.

It may be worthy of remark, that all ſuch ſorts of lime-ſtone as contain impurities, ſuch as clay, ſand, or ſtony matter in their compoſitions, are more proper in general for the purpoſes of agriculture, than for thoſe of building. Where lime-ſtone is plentiful and fuel ſcarce, it might be employed for the purpoſe of huſbandry with great advantage in its uncalcined ſtate, after being pounded or ground into a fine powdery form, by means of mills or other machines. And it is ſtated in the Survey of the County of Perth, that in Rannoch, a diſtrict of that county very remote from coal, a machine was erected by the late commiſſioners of annexed eſtates for this purpoſe, which was driven by a ſtream of water. Mr. Stewart, of Croſmount, who ſaw the machine, the pounded lime-ſtone, and its effect on the land, favoured the author with the following remarks; "There were two pounders, and a third was afterwards added, all from Carron, at a ſmall expence. The pounded lime-ſtone was carried from the machine by a ſmall run of water to three different ponds, one above the other. The upper pond contained the groſſeſt particles, and the lower pond the ſmalleſt or fineſt parts of the lime-ſtone, which reſembled clay or marle from its ſmoothneſs." The middle pond contained that which, it would appear, Mr. Stewart thought to be properly pounded; becauſe he adds, "the run of water might have been ſtronger, which would have enabled the mill to double the quantity grinded, which would ſerve the purpoſe of manure equally well, if not better, than by being pounded ſo very ſmall. All that was pounded before the machine was carried off by a flood, or the moſt of it, was uſed by colonel Alexander Robertſon, uncle to the preſent colonel Robertſon of Struan, who had a farm in the neighbourhood of the mill. The effects of it were viſible upon the ground, which were ſhewn by the colonel to different gentlemen, and approved of." It ſeems, however, that before its virtues could be fully aſcertained by repeated and varied experiments, a torrent in the brook that drove the mill carried all the machinery away, or at leaſt deranged it ſo that it was never reſtored. There is, it is ſuppoſed, little doubt of its beneficial effects on land; or of its effects being more powerful, in one ſhape or other, than thoſe of the ſame quantity of calcined lime-ſtone, becauſe the virtues muſt be in proportion to the quantity of calcareous earth in each. Any given quantity of raw lime-ſtone loſes one-third of its weight when burnt into ſhells. Nothing is here diſſipated except the water; all the calcareous earth remains. It is alſo found, that any given quantity of ſhells produces double that quantity of powdered or ſlaked lime. Therefore, a quantity of raw lime-ſtone, a buſhel for inſtance, has double the quantity of calcareous earth which is in a buſhel of ſlaked lime; conſequently its influence as a manure muſt be double. What is commonly ſuppoſed, and the writer thinks with probability by thoſe who uſed both kinds, without making any accurate experiments, is that the effects of the raw lime-ſtone are ſlow, but more laſting; of the calcined lime, more immediate, but leſs durable.

And it has been ſtated in a periodical work, that "the difference between lime-ſtone, freſh from the rock, and that which has been calcined, conſiſts in the former poſſeſſing, as one of its principal component parts, a very conſiderable proportion of fixed air or carbonic acid, a principle of which it is entirely deprived in the burning, if the operation is properly conducted; a circumſtance well worth the attention of proprietors, as, in that ſtate, its beneficial effects conſiſt chiefly in the power it poſſeſſes of neutraliſing acids, or decompounding metallic oxyds; but upon the animal or vegetable ſubſtances it meets with in the ſoil, it can produce no alteration." For "many years ago, an attempt was made by lord Kames to uſe unburnt lime-ſtone as a manure; the ſucceſs of which, it is believed, has not been recorded; indeed, the trial would probably, it is ſuppoſed, prove abortive, if made upon moſs, or mooriſh lands, which, owing to the great quantity of vegetable matter they contain, cannot poſſibly be benefited by any ſubſtance poſſeſſing leſs activity than quick or cauſtic lime."

A machine for this uſe, that admits of being wrought by ſteam, wind, water, or the power of horſes, is repreſented in *Plate Agriculture*, in which *a* repreſents a beam, ſupported by four ſtrong poſts joined together by tranſverſe pieces of wood, as ſeen in the figure, and at the top ſufficiently ſeparated to allow the wheel to work: *b*, a wheel with a groove on the circumference, ſufficiently deep to receive the beam *a*, with a large iron ſpindle or axis, moveable in a buſh made of bell metal: *c*, a weight of a conical ſhape, of caſt iron; the baſe ſtudded with knobs or protuberances, about two inches long, of a diamond ſhape, terminating in a blunt point, and about five inches in circumference at the bottom: *e*, the face of the weight or pounder, which is hidden from view in the cut: *f*, a circular building ſunk below the ſurface of the ground; the bottom prepared by a ſtratum of clay, well tempered, and mixed with a proportion of burnt lime-ſtone, powdered without being ſlacked, and forge aſhes beat very ſmall. When this is properly dried, a bed of ſand, about 18 inches in thickneſs, is laid about it, and paved with common paving ſtones, of the kind uſed for ſtreets; which, after being well beaten down, is covered with another bed of ſand of the ſame thickneſs, which ſhould be paved in the ſame manner, and afterwards well beaten down. The foundation of the building ſhould be, at leaſt, ſix feet below the common ſurface; which allows 18 inches for the clay, 36 inches for the two beds of ſand, and 18 inches for the two courſes of pavement. And the "circumference ſhould conſiſt entirely of hewn ſtone, at leaſt the uppermoſt three feet of it; the ſtones of which ſhould be ſtrongly batted together with iron, and ſecured on the outſide with numerous wooden poſts drove into the earth, and different courſes of pavement, extending at leaſt ſix feet all round, carefully laid and well beaten down. A floor prepared in this manner, if it is not uſed too ſoon, will reſiſt any force that can be let fall upon it. The lime-ſtone laid into it ſhould not be too ſmall, and ſhould have a light bedding of ſand, in ſoil, to give it ſtability. The building may be of any ſize, according to the powers of the machinery, and the weight of the beater." Others have ſuggeſted, that the pounding of lime-ſtone may be greatly facilitated by a very ſimple contrivance; merely that of kindling a fire upon the ſurface of the rock, or round any quantity of the lime-ſtone after it is quarried, and expoſing the ſtone to the heat of it for ten or twelve hours. During the heating, a great deal of it flies to pieces, and the remainder very readily gives way to the ſtroke of the hammer. It is alſo ſuppoſed, that conſiderable advantage may be derived from a machine of this kind, in reducing burnt lime-ſtone to a powder, before it is ſlaked by the action of the air or moiſture, as, in that ſtate, its operation upon the ſubſtances it meets with in the ſoil is much more conſiderable than after it has abſorbed the fixed air; and when employed in building, it cements immediately, and may be uſed with ſuperior advantage in the conſtruction of aqueducts, harbours, and other ſituations expoſed much to water, and where haſty drying is of importance.

It may be noticed, that the expence of ſuch a machine will vary according to circumſtances, but it cannot be great, and in many places it may be added to threſhing and corn mills, and the expence be greatly leſſened in that way.

It is obvious, that the analyſis of lime-ſtone may be effected in the ſame way as thoſe of other calcareous materials, except that where the ſtone is of a hard and firm texture, it ſhould be reduced into a ſtate of powder, in order to expedite its ſolution. Where the lime-ſtone ſubjected to analyſis does not yield more than two-thirds of its weight of pure chalk, it can ſeldom be burnt with profit; unleſs in a county where fuel is cheap and lime is dear. Good lime-ſtone yields upwards of ninety *per cent.* That of particular quarries is almoſt wholly calcareous, as has been already ſeen.

LIME-*ſtone Gravel*, a hard ſort of calcareous marle, that aſſumes the appearance of ſmall ſtones or gravel, which, when ſpread upon the ground and mixed with it, gradually falls into ſmaller pieces, and fertilizes the ſoil in proportion as it breaks down and mixes with it. It is a ſort of manure little known in Britain, although it is common in many parts of Ireland.

But after what has been already obſerved, little need be ſaid as to the qualities or mode of applying this manure. The farmer will eaſily be able to perceive, that if the pieces of which this gravel conſiſts are large, and diſſolve but ſlowly, the quantity applied at one dreſſing ought to be great, and the effects will be ſlow and laſting; but if the gravel be ſmall, it will require a ſmaller quantity, which will operate more quickly, and laſt for a ſhorter time, like all other calcareous ſubſtances in the ſame circumſtances, or which are applied in the ſame manner to lands.

LIME-*ſtone*, in *Mineralogy*. See LIME.

LIME-*ſtone*, *Magneſian*. See DOLOMITE and RHOMB-SPAR.

LIME-*ſtone*, *Quartzy*. See KONIT.

LIME-*ſtone*, *Fetid*. See SWINE-*ſtone*.

LIME-*ſtone*, *Eccentric*. See ARRAGONITE.

LIME-*water*, *liquor calcis*, *aqua calcis*, *aqua calcis ſimplex*, in the *Materia Medica*, is prepared by pouring twelve pints of boiling diſtilled water on half a pound of lime, and ſtirring them together: let the veſſel be immediately covered, and left to ſtand for three hours; then keep the ſolution upon the remaining lime in ſtopped glaſs bottles, and pour off the clear liquor when it is wanted for uſe. Lime is ſoluble in about 450 times its weight of water, or little more than one grain in one fluid-ounce, forming a tranſparent ſolution; hence the proportion here directed, is in fact more than is required for the ſaturation of the water; but the larger quantity allows, moreover, for any impurity contained in the lime, and as it is a cheap article, the quantity uſed is ſcarcely of any importance. The proceſs here adopted is ſimple, efficacious, and convenient, and by keeping the ſolution ſtanding upon the lime it will always be ſaturated; and the place of any cruſt of carbonate of lime which forms upon the ſurface, if expoſed, will be ſupplied from the lime, which remains in a ſtate ready for ſolution. Lond. Pharm. 1809.

The general opinion of lime acting as a cauſtic, and conſuming the bodies it was made to act upon, by means of the great quantity of particles of fire it contained, long denied any preparation of it a place among internal medicines; at length, water poured upon it was found to take in a part of its virtues, and to be a valuable medicine, and very ſafely to be given internally in large quantities.

For this purpoſe, a gallon and a half, or two gallons of water, were poured by degrees upon a pound of freſh-burnt quick-lime; the veſſel ſhaken when the ebullition ceaſed, and then ſet by, till the undiſſolved lime had ſettled; after which, the liquor was poured off, and paſſed through a filtre. Only a ſmall portion of the lime is diſſolved by the water, and the remainder gives a ſtrong impregnation to large quantities of freſh water, though not ſo ſtrong as the firſt; great part remaining at laſt undiſſolved: this reſiduum, calcined again, becomes quick-lime, as before; and by repetitions of this proceſs, nearly the whole may be diſſolved. The ſolution has a ſtrong ſtyptic taſte; and its effects in chemical mixtures are ſimilar to thoſe produced by quick-lime. In veſſels quite filled with lime-water, and exactly cloſed, it may be kept unchanged for many months; but in open veſſels, the calcareous matter ſoon ſeparates from the aqueous fluid, and forms a cruſt or cream upon the ſurface, inſipid and indiſſoluble as the earth in its natural ſtate, and again convertible into quick-lime by repeated calcination. It is obſerved, that the quantity of calcareous matter that is thus ſeparated from lime-water, is even greater than it ought to be, if it was exactly proportioned to the evaporation of the water; the cauſe of which is, that the quick-lime gradually recovers from the air as much gas as is neceſſary to deprive it of its properties of quick-lime, and to reſtore it to its ſtate of ſimple calcareous earth, mild, effervеſcing, and unſoluble in water. Hence lime-water by long expoſure to air, loſes much of its ſtrength, and at laſt becomes almoſt inſipid. It is neceſſary alſo, when this liquor is employed as a menſtruum, to add ſome quick-lime in ſubſtance, in order to continue the impregnation of the water with the lime.

All lime is not equally good for the making of this water; but the ſeveral kinds differ, according to the ſubſtances they are made from. In Holland they make lime of ſea-ſhells, which they find in vaſt abundance on their ſea-ſhores. This was alſo a practice in the time of Dioſcorides; but the lime thus made, it has been ſaid, is not fit for making lime-water. The water made from it does not keep long, and is leſs ſtyptic, and ſweetiſh to the taſte, and is greatly inferior to the water made with lime burnt from ſtones. The newer the lime is, the leſs it has been expoſed to the air, and the drier it has been kept, and finally, the more it has held together without crumbling, or mouldering to powder, the better it is for making lime-water. Mem. Acad. Par. 1700.

It appears now, from the ingenious Dr. Alſton's experiments, that one part of quick-lime is ſufficient for five or ſix hundred parts of water. Water will diſſolve but a certain portion of quick-lime; and how much that is cannot be eaſily aſcertained. So far ſeems certain from Dr. Alſton's experiments, that one pound of quick-lime is ſufficient for making ſix hundred pounds of good lime-water; and that thoſe who with Charas have ſuppoſed, that the ſecond and third lime-water is weaker than the firſt, have been led into an error by the ſmall quantity of water they uſed. And it has been generally believed, that in order to obtain good lime-water, the quick-lime muſt not only be recent and fully calcined, but alſo for one part of quick-lime only eight, ten, or, at moſt, twelve parts of water taken; as if it could impregnate no more. But the doctor ſays he has found, by many experiments, that it is altogether indifferent whether the water be hot or cold, poured on gradually, or at once, the water poured on the lime, or the lime thrown into the water; whether the quick-lime be in ſhells or ſlaked; or even expoſed to the air for ſeveral months, for ſuch quantities of the water as are commonly uſed; and if the quick-lime be freſh, whether for one pound of it, eight, ten, twenty, fifty, or five hundred pounds of water be taken. Only it is neceſſary, even for the firſt water after the ebullition is over, to ſtir and mix the lime with the water, and allow it time to impregnate itſelf; which is beſt known by the cruſt formed on its ſurface. Filtration indeed is not neceſſary, if it be not to prevent any undiſſolved lime being mixed with it; or cruſts diminiſhing its tranſparency.

The doctor, for his own uſe, poured about eight pounds of boiling water upon a pound of ſtone quick-lime in a glazed earthen veſſel. He drank about a pint and a half of this lime-water daily for about ſixteen months; filling up the veſſel, when neceſſary, with freſh water, ſometimes hot and ſometimes cold, without obſerving any difference in the lime-water, which he conſtantly filtered through grey paper before he drank it. He obſerved, that the lime was not exhauſted after two years and two months, nor was the water ſenſibly weaker, when it ſtood a ſufficient time on the lime, which he knew by the cruſts that were formed. But the lime becoming conſiderably lighter, after it is long thus uſed, it at length requires ſeveral days to ſubſide, and form the cruſts, and after the cruſts are formed, it does not leave half the water clear as it did at firſt. On the whole, this ſingle pound of lime afforded the doctor about ſix hundred pounds of lime-water. He adds, that having taken lime-water made indifferently of lime-ſtone, or of chalk, or of ſhells, and ſometimes made of all the three together, he was never able to diſcover any difference in their effects. But ſo much lime-water is not to be obtained from quick-lime, unleſs it be freſh, completely calcined, and free from heterogeneous ſubſtances; for if defective in any of theſe, it will yield proportionably leſs lime-water. Lewis's Mat. Med. and Macquer's Chem. Dict.

Mr. Burlet has given an ample account of its effects in the French Memoirs, chiefly from his own experience. But he obſerves, it ſucceeded much better in Holland, &c. than in France. It is a powerful alterant, and, like a pure alkaline water, fitted to blunt and deſtroy acid ferments, which are the principles of all obſtructions, and the cauſe of moſt chronic diſeaſes. Its principal uſe is in cachexies, green-ſickneſs, dropſy, ſcurvy, obſtructions on the liver, ſpleen, &c.

Experience has ſhewn lime-water to be an excellent medicine in many caſes; in the gravel and ſtone particularly. And it has alſo been found very ſerviceable in the gout, in habitual relaxations of the bowels, and in other caſes of relaxation. In ſome kinds of the ſcurvy likewiſe it is of uſe; and is often applied with ſucceſs externally to ulcers, &c.

Fabricius ab Aquapendente aſſures us, he cured a ſcirrhous ſpleen, and the dropſy, by a continued uſe of ſponges dipped in common lime-water, and placed near the part affected. Boyle's Works, Abr. vol. i. p. 80.

Lime-water, which was long looked on as a cauſtic, was, in the laſt century, found to be a very ſafe and valuable remedy. It is uncertain who firſt ventured to give it inwardly, but Willis, Bates, and Moreton, ſeem to have uſed it much.

Lime-water kills worms, and many other, if not all, inſects. Hence Dr. Alſton concludes, it might prove a good anthelmintic for children; and experience has confirmed this notion.

It is probable, that lime-water may be of great uſe in long ſea-voyages, preventing the corruption of water, or inſects breeding in it, as well as curing the diſeaſes to which ſea-faring people are moſt ſubject. The experiment is certainly ſafe, eaſy, and attended with no expence; one pound of freſh well-burnt quick-lime of any kind being enough for a hogſhead of water, which may not only be uſed for common drink by the diſeaſed, or for prevention by the healthy; but alſo by boiling and expoſing it to the air for a ſhort time, it may be reduced to ſweet water, and uſed in dreſſing the victuals of the moſt delicate.

The virtues of lime-water do not depend on its abſorbency; and it may as juſtly be called antalkaline, as antacid.

Lime-water prevents, or long protracts, the putrefaction of animal ſubſtances. Dr. Alſton alſo thinks that quick-lime in a ſhip's well would effectually prevent the corruption of the water, and conſequently the putrid ſteams, or foul air, thence ariſing, which ſometimes prove fatal to the crew.

The virtues of lime-water outwardly applied in many diſeaſes of the ſkin, in excoriations, ulcers, gangrenes, &c. are well known. Perhaps there is not a better gargariſm for ſeveral ſorts of ſores in the mouth and throat than lime-water. It has alſo been known to be of great uſe in the tooth-ache. Inwardly taken, lime-water has all the virtues of pure element, which are not a few; and on which probably depend the good effects of mineral waters, more than on the minerals they contain. Dr. Alſton never found it cauſed thirſt; on the contrary, he found it quenched thirſt as well as ſimple water, and cuſtom rendered it agreeable. Lime-water is notably detergent and attenuating, even more ſo than ſoap itſelf, of mucous, viſcid, and other animal ſordes, which makes it preferable, in many caſes, to the pureſt, as well as to mineral waters. In a word, lime-water may be ſaid, in general, to purify the blood, with as good reaſon, as any other medicine whatever, eſpecially from any putrid, purulent, or ſcorbutic foulneſſes.

Dr. Lewis obſerves, that lime-water, drank to the quantity of a quarter of a pint three or four times a day, has been found ſerviceable in ſcrofulous complaints, fluxes, ſeminal weakneſſes, and other diſorders proceeding from an impurity of the fluids, or laxity and debility of the ſolids. It generally promotes urine; oftentimes the cuticular diſcharge; and, where the ſtomach is oppreſſed with viſcid phlegm, expectoration. It for the moſt part binds the belly, and ſometimes occaſions a troubleſome coſtiveneſs, unleſs this effect be occaſionally provided againſt by the interpoſition of proper laxatives. It anſwers beſt in cold, ſluggiſh, phlegmatic, and corpulent habits; and is to be uſed more cautiouſly in hot, bilious diſpoſitions, and where the patient is much emaciated, or the appetite weak, and at the time of any critical or periodical evacuation. It has been cuſtomary to impregnate lime-water with different materials, partly for rendering it more acceptable to the palate and ſtomach, and partly for improving its medicinal efficacy againſt cutaneous defedations. The college of Edinburgh directed, in this view, three ounces of the ſhavings of the wood and bark of ſaſſafras, one ounce and a half of ſhaved liquorice, and four drams and a half of bruiſed nutmegs; the college of London, half an ounce of ſaſſafras bark, and one ounce of liquorice, with the addition, in ſome caſes, of four ounces of raſped guaiacum wood, and three drachms of coriander ſeeds; to be macerated for four days in three quarts of lime-water, and the liquid ſtrained off for uſe. Theſe infuſions are taken in the ſame quantities as the ſimple lime-water, by themſelves, or with the addition of milk. Lewis's Mat. Med.

But Dr. Macbride obſerves, that the activity of lime-water is impaired by infuſing vegetable ſubſtances therein, which contain much fixed air, ſuch as the guaiacum or ſaſſafras; for theſe woods, abounding in reſin, give out their cementing principle, which, uniting with the diſſolved quick lime, reſtores it to its original ſtate of an inactive calcareous earth: therefore, when it is intended that theſe woods, or any other ſubſtance of the like nature, ſhould give out their virtue to lime-water, and that the water ſhould, at the ſame time, contain its due proportion of diſſolved lime, ſome quick-lime ought to be added, during the time of maceration. He alſo obſerves, that as milk contains a large proportion of fixed air, it ought not to be mixed with lime-water, ſince it muſt neceſſarily take off from its activity. To the ſame purpoſe, Dr. Alſton has obſerved, that there is ſcarcely any thing that is uſually mixed and given along with lime-water, that does not, more or leſs, deſtroy its efficacy; for which reaſon he recommended it always to be taken alone. Macbride's Eſſays, p. 250. 271.

It is obſerved by Dr. Lewis, that lime-water diſſolves, by the aſſiſtance of heat, mineral ſulphur, vegetable oils and reſins, and animal fats. It extracts alſo, in the cold, the virtues of ſundry reſinous and oily vegetables, and diſſolves thick phlegm, and mucous matters, and the curd of milk, with which laſt it forms a white liquid, nearly ſimilar to milk in its natural ſtate. But the diſſolvent power of quick-lime has been evinced by Dr. Macbride, and ſhewn to extend to a variety of different ſubſtances, as camphor, myrrh, gum guaiacum, aſa fœtida, aloes, caſtor, balſam of Tolu, maſtich, jalap, and the cortex Peruvianus, which were found to yield ſtrong ſolutions and tinctures; and theſe, he ſays, are more elegant medicines, and perhaps may be found more efficacious than the ſpirituous tinctures, ſince they will never become turbid, or ſeparate on being mixed in any watery vehicle. And ſince the ſolvent power of quick-lime is found to depend on its depriving certain ſubſtances of that fixed air or carbonic acid, which is their cementing principle, it was natural to imagine that it might be uſefully applied to the ſolution of the human calculus or ſtone.

Of the various ſubſtances examined by Dr. Hales, with a view of determining their reſpective quantities of fixed air, the human calculus was found to contain the largeſt proportion; above one-half of this maſs conſiſting of fixed air. Nevertheleſs, if the cauſtic alkali, or lime-water, could be ſafely conveyed to it, theſe would abſorb the fixed air, and the earthy parts, deprived of what bound them together, muſt preſently fall to pieces. That lime-water is lithontriptic has been ſhewn ſufficiently by Dr. Hales, and more fully by Dr. Whytt. See his Eſſay on the virtues of Lime-water, in the Cure of the Stone, and Edinb. Eſſ. &c. vol. i. art. 13. p. 383. vol. v. art. 69.

This gentleman prefers calcined oyſter-ſhell lime-water to any other; which, he ſays, proves a more active menſtruum for this concrete, than that made from the ſtone limes; the diſſolving power of the oyſter-ſhell lime-water ſeeming, from Dr. Whytt's experiments, to be more than double to that of the ſtone lime-waters. Dr. Alſton ſeems to think this a matter of indifference; and was himſelf cured chiefly by the ſtone quick-lime water before mentioned. This lithontriptic quality of lime-water has been farther confirmed by Dr. Alſton, who has ſhewn the efficacy of lime-water in this reſpect, not only when made by the firſt infuſion, and aſſiſted by artificial heat, but even after fifty or more infuſions, and in the common air. The doctor thinks that the energy of lime-water in this caſe probably conſiſts in its penetrating detergency, whereby, inſinuating itſelf among the ſolid parts of the calculi, or into their pores, it ſeparates them, or diminiſhes their coheſion, but does not diſſolve them. See LITHONTRIPTIC.

But the efficacy of quick-lime and cauſtic alkali in this intention, is now known to depend principally, if not entirely, on its power of abſorbing the air, which binds calculous ſubſtances together. However, the alkali, when combined with oil, and made into ſoap, is not only ſo greatly obtunded thereby, as to loſe much of its power, but the ſoap itſelf is ſo nauſeous, that few perſons can be induced to take it in a quantity ſufficient to prove of much effect: it would, therefore, be a happy diſcovery if any vehicle could be found out that would ſheathe the acrimony of the cauſtic alkali, ſo as to allow it to be taken in large and continued doſes. Poſſibly, ſays Dr. Macbride, veal broth, or a decoction of marſhmallow roots, might be found to anſwer this purpoſe; and lime-water might be taken at the ſame time, which would not at all interfere with the operation of the alkali, but rather add to its activity. Dr. Chittick's noſtrum, which is found, after a perſeverance of ſome months, actually to diſſolve the ſtone, is ſaid to be nothing more than the cauſtic alkali, given in veal broth. But lime-water, when taken alone, muſt often fail in producing any conſiderable effect as a lithontriptic, becauſe it will loſe much of its power, as Dr. Macbride has ſhewn, from the fixed air of the alimentary ſubſtances in the firſt paſſages, who, therefore, recommends it to be drank when the ſtomach is empty; and alſo, as Dr. Whytt and Dr. Macbride have proved by experiments, from the fixed air of the urine itſelf, which will ſaturate great part of the quick-lime, even when it hath reached the bladder. Macbride's Eſſays, eſſ. 5. paſſim.

Since there is but a ſmall proportion of lime in the water, it may be thought that taking a few grains of the quick-lime in ſubſtance would prove much more effectual in the ſtone, than large quantities of lime-water. But this is a miſtake; and hence Mrs. Stephens's egg-ſhells and ſnail-ſhells, if burnt to quick-lime, can never be equally ſucceſsful with lime-water for the ſtone.

As for the *aquæ benedictæ compoſitæ*, or compound lime-waters, they are not to be compared with ſimple lime-water in the gravel; nor, in Dr. Alſton's opinion, in any diſeaſe requiring this water.

The doctor adds, in his Appendix, that though he cannot yet determine how far lime-water may be proper, even in acute diſtempers, yet he has found it ſafe in feveriſh colds; and by the caſes he there mentions, it ſeems probable that lime-water, by its diluent and diuretic qualities, may prove more uſeful in fevers than is at preſent believed.

However this may prove on farther trials, it may be ſaid, in general, that lime-water is diluent, detergent, antiſeptic, anthelmintic, diuretic, and vulnerary; uſeful in all diſeaſes proceeding from, or accompanied with, obſtructions in the bowels or glands, viſcid phlegm, calculous concretions, or putrefaction; and commended for the ſcurvy, ſcrophulæ, gravel, conſumptions, empyema-aſthma, arthritis vaga, œdematous ſwellings, diabetes, fluor albus, fluxes, &c. and outwardly for diſeaſes of the ſkin, ulcers, gangrenes, &c. It may be taken to the quantity of a pound, once, twice, or thrice a day; or uſed for common drink. See Dr. Alſton's Diſſertation on Quick-lime, and Lime-water, Edinb. 1752. See LITHONTRIPTIC.

LIME-*Water*, in *Gardening*, an uſeful kind of water, which is prepared by ſlaking cauſtic lime in ſoft water, in the proportion of half a peck of the former to thirty-two gallons of the latter, letting them remain ſome time before they are made uſe of, ſtirring them well, two or three times a day, for two or three days. It is a liquid which, when the lime has ſubſided, is found highly uſeful in clearing fruit-trees from the ravages of the Aphis puceron, or vine-fretter. It ſhould be applied once a day by means of an engine, ſo as to be thrown as much as poſſible on the under ſides of the leaves, and with conſiderable force, preſſing the fore finger upon the end of the pipe, to make it ſpread like ſmall rain, and taking care that every part of the tree be well watered. It ſhould be done as much as poſſible in cloudy weather, and when the ſun is off the walls. Where the trees have an eaſterly aſpect, they may be watered about half-paſt eleven o'clock in the forenoon, and in a northern one, the firſt thing in the morning; but in a ſouthern aſpect, about four o'clock in the afternoon. But when northerly or eaſterly winds and froſty nights prevail, it ſhould be diſcontinued till the weather becomes mild. The trees ſhould always get dry before night, and never be watered when the ſun is upon them. Care muſt likewiſe be taken that the grounds of the lime be not made uſe of, as it would make the trees have a diſagreeable appearance, and perhaps be injurious. See PUCERON and VINE-FRETTER.

LIME-*Work*, ſuch works or kilns as are conſtantly employed in the manufacturing of lime. A late writer has thought it neceſſary, that the managers of eſtates ſhould underſtand the nature of this ſort of manufacture, though it is ſeldom neceſſary or eligible for a large proprietor of land to carry on his own lime-works, "unleſs during a limited time, at the outſet of new works, to aſcertain their value," as there are always enterpriſing men who will give more rent for a work, than the profits ariſing from it to a proprietor, even when under the direction and management of the moſt faithful perſon. They and the lands attached to them ſhould rather be conſidered by ſuch proprietors as farms, the building of kilns and ſheds as erecting farm offices, and the laying out and conſtructing of roads, railways, &c. as general improvements of their eſtate; the tenants agreeing to work the quarries agreeable to articles, and to keep the kilns, building, and roads in ſtates of proper repair.

LIME, in *Geography*, a town of America, in Grafton county, New Hampſhire, ſituated on the E. bank of Connecticut river; 12 miles N. of Dartmouth college, and containing 1318 inhabitants.

LIMER, LYEMMER, or *Lime-hounds*. See *Blood*-HOUND and DOG.

LIMERICK, in *Geography*, a county of Ireland, in the province of Munſter, called from the town of the ſame name, which was, from the earlieſt times in Iriſh hiſtory, a place of conſiderable importance. At the time when the Iriſh chieftains did homage to Henry II. Daniel O'Brien, king of Limerick, was of the number. This prince appears to have been alſo ſovereign of Clare, which was then called Thomond. Limerick is bounded on the north by the counties of Clare and Tipperary, being ſeparated from the former by the river Shannon, on the weſt by Kerry, on the ſouth by Cork, and on the eaſt by Tipperary. Its length from eaſt to weſt is 40 Iriſh (51 Engliſh) miles. Its breadth from north to ſouth 25 Iriſh (32 Engliſh) miles. It contains 386,750 acres, or 604 ſquare miles Iriſh, equal to 622,975 acres, or 970 ſquare miles Engliſh. There are 125 pariſhes, which by unions form 60 benefices, of which 33 only had pariſh churches at the time Dr. Beaufort publiſhed. The pariſhes are moſtly in the dioceſes of Limerick and Emly. The population was ſtated by Dr. Beaufort at 170,000, but it muſt have conſiderably increaſed. The ſoil of Limerick is extremely good for tillage, and very productive of graſs; eſpecially thoſe grounds which are called the *coreachs*, whoſe fertility is proverbial, and is cauſed by the rich manure which is annually depoſited by the overflowings of the Shannon. The heavieſt and fatteſt beaſts that are ſlaughtered at Cork are fed in this county; much butter is exported from it; the orchards produce a very fine cyder, and it is by no means deſtitute of trees and plantations. The paſture ſyſtem, which has been on the decline in moſt parts of Ireland ſince the introduction of corn bounties, propoſed by that enlightened friend of his country, the Rt. Hon. John Foſter, when chancellor of the exchequer, ſtill continues in Limerick, but is on the decline. Even when Mr. Young wrote in 1778, he obſerved a great increaſe of tillage; "thrice the corn grown that there was formerly; much paſturage broken up on this account, ſome bullock land and ſome ſheep land." The ſame intelligent writer alſo ſpeaks of improvement in the ſtate of the poor, but this ſtill wants amelioration. Limerick, though diverſified by ſmall hills, is not at all mountainous, except on the ſouth-eaſt, where it is bounded by the Galtees, a ridge of formidable mountains, that extend into Tipperary, and on the borders of Kerry, where it grows uneven, and forms a grand amphitheatre of low but ſteep mountains, which extends in a wide curve from Loghil to Drumcollohen. In the firſt of theſe riſes the river Maig, which croſſes the county, and falls into the Shannon; as do many fine ſtreams by which it is plentifully watered. In the weſtern hills are the ſources of the Feale and the Gale, which run weſtward through Kerry, and of the *Black* water which flows in a contrary direction through the county of Cork. Limerick is the county town; for which ſee the next article. There are no other towns of conſequence. A colony of palatines from Germany was ſettled in this county about a century ago, by a former lord Southwell. Of theſe Mr. Young mentions ſome particulars which are intereſting. "They have in general leaſes for three lives, or 31 years, and are not cottars to any farmer, but if they work for them, are paid in money. The quantities of land are ſmall, and ſome of them have their feeding land in common by agreement. They are different from the Iriſh in ſeveral particulars; they put their potatoes in with the plough in drills, horſe-hoe them while growing, and plough them out. One-third of the dung does in this method, for they put it only in the furrows, but the crops are not ſo large as in the common method. They plough without a driver: a boy of twelve has been known to plough and drive four horſes, and ſome of them have a hopper in the body of their ploughs, which ſows the land at the ſame time it is ploughed. Their courſe of crops, 1. Potatoes, 2. Wheat, 3. Wheat, 4. Oats; or 1. Potatoes, 2. Barley, 3. Wheat, 4. Oats: in which management they keep their land many years, never laying it out as their neighbours do. They preſerve ſome of their German cuſtoms; they ſleep between two beds: they appoint a burgomaſter, to whom they appeal in caſe of all diſputes;

and they yet (1778) preſerve their language, but that is declining. They are very induſtrious, and in conſequence are much happier, and better fed, clothed, and lodged, than the Iriſh peaſants. We muſt not however conclude from thence, that all is owing to this; their being independent of other farmers, and having leaſes, are circumſtances which will create induſtry. Their crops are much better than thoſe of their neighbours. There are three villages of them, about 70 families in all. For ſome time after they ſettled, they fed upon ſour crout, but by degrees left it off, and took to potatoes; but now ſubſiſt upon them and butter and milk, but with a great deal of oat bread, and ſome of wheat, ſome meat and fowls, of which they raiſe many. They have all offices to their houſes, that is, ſtables and cow-houſes, and a lodge for their ploughs, &c. They keep their cows in the houſe in winter, feeding them upon hay and oat ſtraw. They are remarkable for the goodneſs and cleanlineſs of their houſes. The women are very induſtrious, reap the corn, plough the ground ſometimes, and do whatever work may be going on; they alſo ſpin, and make their children do the ſame." The late Silver Oliver, eſq. of Caſtle Oliver, planted another colony, taken from this firſt, of about 66 families, amounting to 700 Proteſtants, on his eſtate, and of theſe Mr. Young gives a ſimilar account. But with theſe exceptions, the huſbandry of the county of Limerick is perhaps the work in Munſter, which is attributed to the natural richneſs of the ſoil, and to the greater prevalence of the grazing ſyſtem. Mr. Young ſays, that the rich land reaches from Charleville, at the foot of the mountains, to Tipperary by Kilfenning, a line of 25 miles, and acroſs from Ardpetuch to within four miles of Limerick 16 miles. Bruff, Kilmallock, and Hoſpital have very good land about them; the quantity in the whole conjectured to be 100,000 acres. This is chiefly under bullocks. The corceſſes on the Shannon are from two to three miles broad. There is alſo a light lime-ſtone land, for ſheep and cows. Mr. Young, ſpeaking of the land near Caſtle Oliver, in the rich diſtrict, ſays, "it is a rich, mellow, crumbling, putrid, ſandy loam, 18 inches to three feet deep, the colour a reddiſh-brown. It is dry ſound land, and would do for turnips exceedingly well, for carrots, for cabbages, in a word for every thing. I think, upon the whole, it is the richeſt ſoil I ever ſaw, and ſuch as is applicable to every purpoſe you can wiſh; it will fat the largeſt bullock, and at the ſame time do equally well for ſheep, for tillage, for turnips, for wheat, for beans, and in a word for every crop and circumſtance of profitable huſbandry." After ſome other particulars he concludes thus: "The face of the country is that of deſolation; the grounds are over-run with thiſtles, ragwort, &c. to exceſs; the fences are mounds of earth, full of gaps; there is no wood, and the general countenance is ſuch that you muſt examine into the ſoil before you will believe that a country, which has ſo beggarly an appearance, can be ſo rich and fertile." Theſe remarks were written above 30 years ago, and improvement has ſince taken place, but they are ſtill too applicable. Limerick is repreſented in the imperial parliament by three members, two for the county, and one for the city. This county has not yet had a ſtatiſtical account of it publiſhed. Beaufort. Young.

Limerick, a city of Ireland, capital of the county of the ſame name, ſtrongly ſituated on the river Shannon, on an iſland in which it is partly built. It is a poſt-town, and is repreſented in parliament. The new port, which is connected with the old city by a bridge, is called Newtown Pery, from the Pery family, the head of which is now earl of Limerick, whoſe eſtate it is. The buildings are of brick, large, and uniform, ſo that whilſt the old town has a very ruinous appearance, this port will bear compariſon with the beſt ſtreets in almoſt any other city, except where public buildings contribute to ornament them. The public buildings are not many, or deſerving of much notice. The cuſtom-houſe is a plain building. The cathedral is an ancient and venerable pile. The biſhop's palace is a comfortable modern houſe at the weſt end of the city. The corporation of Limerick is what may be called a cloſe one, as no perſon can be become a freeman, except by favour of the council; freeholders, however, can vote at the election of members of parliament. The magiſtrates are a mayor, two ſheriffs, a recorder, a town-clerk, aldermen and burgeſſes; it hath alſo a military governor, conſtable and town major, and is the reſidence of the general commanding a diſtrict. The population probably exceeds 50,000. The trade of Limerick is very extenſive, and is rapidly increaſing. Its export of corn is perhaps the greateſt in Ireland, and its corn-market is very convenient. It muſt more and more derive benefit from the canal connecting the Shannon with the Liffey. There are ſix churches, a Preſbyterian meeting-houſe, a Methodiſt meeting-houſe, a Quakers' meeting-houſe, and ſeveral chapels for Roman Catholics, who form the greateſt part of the population. There are alſo ſome charitable inſtitutions well attended to, and a public library, lately inſtituted. The inhabitants are reckoned gay and fond of ſociety, and public amuſements are in general well ſupported. Limerick, being naturally a city of ſtrength, and formerly well fortified by art, has always been deemed a place of conſiderable importance. In 1651 it was taken by Ireton, in the ſervice of the parliament, after a vigorous ſiege. In 1690, it was unſucceſsfully beſieged by king William in perſon. In 1691, it ſurrendered to general Ginkle, afterwards earl of Athlone, on terms of capitulation very advantageous to the beſieged, and all who profeſſed the Roman Catholic religion, which are called the *articles of Limerick*. Limerick is 94 Iriſh miles S.W. from Dublin. Beaufort, Young, Carliſle.

Limerick, a biſhopric of Ireland, in the eccleſiaſtical province of Caſhel, united to the biſhoprics of Ardfert and Aghadoe, in the year 1663. The two latter have been long incorporated ſo as to form but one dioceſe; the dignity of archdeacon, and the ruined walls of a church with a round tower, are all the memorials of the biſhopric of Aghadoe that now remain. The whole union comprehends great part of the county of Limerick, the whole of Kerry, and a few pariſhes in the counties of Cork and Clare. There are in all 176 pariſhes, which are united ſo as to form 88 benefices, and of theſe only 47 have churches, and 14 glebe houſes. It is to be remembered, however, that the population is not Proteſtant. Beaufort.

Limerick, a poſt-town of America, in York county and ſtate of Maine, near the confluence of Oſſipee river with Saco, and oppoſite to Gorham; incorporated in 1787, and containing 995 inhabitants.—Alſo, a townſhip in Montgomery county, Pennſylvania, containing 999 inhabitants.

LIMESOL, **Limassol**, or **Limisso**, a town of the iſland of Cyprus, formerly *Nemoſia*, is now in a miſerable ſtate, abounding with ruins and rubbiſh. Its harbour, however, is not a little frequented; here veſſels are loaded with grain, cotton, and other productions of the ſoil. The beſt Cyprus wines are made in its environs, and it is the emporium of all thoſe of the iſland who are concerned in trade. Not far from this town, if it deſerves that appellation, ſtood the ancient "Limaſſol," which ſtill, at a period of remoter antiquity, was called *Amathus*, celebrated for a temple conſecrated to Venus and Adonis, in which was preſerved, according to Pauſanias, a rich necklace of precious ſtones, ornamented with gold, the work of Vulcan, and given in the firſt inſtance to Hermione. But this ancient town is deſtroyed. (See AMATHUS.) Near Limaſſol, E. of it, is the moſt ſouthern promontory of the iſland, formerly named the promontory of *Agrotiri*, at preſent Cape di Gatti or *Gatto*, on account of the great number of cats kept by the monks, who, in the 4th century, obtained permiſſion to eſtabliſh themſelves there, as well as on mount Olympus, on condition of keeping many of thoſe animals for hunting and deſtroying ſnakes, which had multiplied in the iſland. (See GATTO and CYPRUS.) Limaſſol is the ſee of a biſhop, ſuffragan of Nicoſia. N. lat. 34° 45′. E. long. 32° 30′.

LIMESTONE, a poſt-town of America, in Kentucky, on the S. ſide of Ohio river, and on the W. ſide of a ſmall creek of the ſame name. This is the uſual landing place for people who come down in boats with an intention of ſettling in the upper parts of the ſtate, and here the champaign country on the E. ſide of the river begins; four miles N.E. of Waſhington. N. lat. 38° 40′. W. long. 84° 17′.

LIMETREE, in *Gardening*, is a tree of the deciduous kind, occaſionally uſed in plantations for its wood, &c. There are four ſpecies, each of which is capable of being raiſed from layers and cuttings.

It is ſuggeſted by Mr. Nicol, that this ſort of tree ſucceeds in the moſt perfect manner, in "low, deep, ſubhumid loams," but that "in dry gravelly ſoils, it loſes the beautiful gloſs of its foliage, for which it is ſo much admired in the early ſummer ſeaſon."

It may be noticed that the timber of the limetree is uſed by carvers, it being a ſoft light wood; as alſo by architects for framing the models of their buildings, &c. The turners likewiſe uſe it for making light bowls, diſhes, &c. but it is too ſoft for any ſtrong purpoſes. See CITRUS, in *Botany*, *Gardening*, and *Planting*. See alſo TILIA.

LIMETREE *Bay*, in *Geography*, a bay on the S. coaſt of Santa Cruz. N. lat. 17 45′. W. long. 63 27′.

LIMEUM, in *Botany*, appears from Pliny to be a name of Gallic origin for a plant with which the ancient Gauls poiſoned their arrows. This appellation, however, could not have been originally applied to the preſent genus, all the ſpecies of which are natives of the Cape of Good Hope. Linn. Gen. 184. Schreb. 246. Willd. Sp. Pl. v. 2. 291. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. 337. Juſſ. 314. Lamarck Illuſtr. t. 275. Gærtn. t. 76.—Claſs and order, *Heptandria Digynia*. Nat. Ord. *Holeraceæ*, Linn. *Portulaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, permanent, of five, ovate, acuminated, carinated leaves, membranaceous at the margin, two of them exterior. *Cor.* Petals five, equal, ovate, with a ſlight claw, obtuſe, ſhorter than the calyx; nectary forming a margin round the germen, bearing the ſtamens. *Stam.* Filaments ſeven, awl-ſhaped, ſhorter than the corolla; anthers ovate. *Piſt.* Germen ſuperior, globoſe. Style cloven, cylindrical, ſhorter than the ſtamens; ſtigmas rather obtuſe. *Peric.* Capſule globoſe, of two cells. *Seeds* ſolitary, hemiſpherical, hollow.

Obſ. We are induced to follow the opinion of Linnæus reſpecting the capſule of this genus, as it undoubtedly belongs to the *Portulaceæ* of Juſſieu. See Gærtner and Schreber.

Eſſ. Ch. Calyx of five leaves. Petals five, equal. Capſule globoſe, of two cells. Seeds ſolitary, concave.

1. L. *africanum*. Linn Sp. Pl 488. Thunb. Prod. 68.—Leaves oblong, on footſtalks.—A native of the Cape, whence it was brought by Mr. Francis Maſſon into the Royal Garden at Kew in the year 1774. It flowers in June and July. Linnæus juſtly remarks, that this ſpecies has the appearance of *Corrigiola* or *Telephium*. The *root* is perennial. *Stems* proſtrate, feeble, a ſpan long, angulated, naked, perennial at the baſe. *Leaves* alternate, remote, linear-lanceolate, or oblong, about an inch in length. *Corymbs* of green and white *flowers* terminal, ſolitary, compound, naked, on long ſtalks.—Martyn ſays that the leaves of this are ſubject to vary; for that "in the Bankſian herbarium may be ſeen linear, oblong, ovate, roundiſh and ſpatulate leaves, if the ſpecimens be all of one ſpecies."

2. L. *capenſe*. Willd. n. 2. Thunb. Prod. 68. (L. incanum; Mart. Mill. Dict. v. 3. L. aphyllum; Linn. Suppl. 214.)—Leaves ovate, ſeſſile.—It is curious that the younger Linnæus ſhould have given this the ſpecific name of *aphyllum*, remarking that it appears to be without *leaves*, when at the ſame time he deſcribes them as ovate and ſeſſile. Martyn, judging from Maſſon's ſpecimen in the Bankſian herbarium, ſays, that L. *capenſe* is a ſmall plant, extremely woody at the bottom. *Leaves* ovate, almoſt ſeſſile, and as woolly as thoſe of mullein; radical ones numerous; ſtem-leaves fewer.

3. L. *æthiopicum*. Willd. and Thunb.—Leaves linear-lanceolate. This ſpecies is only known from being mentioned by Thunberg and adopted by Willdenow and Martyn. The laſt author juſtly obſerves, that we have a deplorable inſtance, in theſe three ſpecies of *Limeum*, of trivial names which are not given for the ſake of true diſtinction: all the plants being natives of the Cape, though ſeverally called *africanum*, *capenſe*, and *æthiopicum*.

We further learn from profeſſor Martyn, that there is a fourth ſpecies in the Bankſian herbarium, which is truly a ſhrub, and may be called L. *fruticans*.

LIMINGO, in *Geography*, a town of Sweden, in the government of Ulea; 11 miles S. of Ulea.

LIMINGTON, a town of America, in York county, and ſtate of Maine, bounded N. and E. by Saco river; 50 miles N. of York.

LIMIT, in *Mathematics*. See LIMITS.

LIMIT *of diſtinct viſion*, in *Optics*. See *Diſtinct* VISION.

LIMITATION, LIMITATIO, in *Law*, is a certain time aſſigned by ſtatute, within which an action muſt be brought; and limitation of time is two-fold; *viz.* to make title to an inheritance by the common law; and in writs by ſeveral ſtatutes. There is a limitation in real and perſonal actions; and in the former, he that will ſue for any lands or hereditaments, ought to prove, that he or his anceſtors were ſeiſed of the lands ſued for by writ of aſſize, or he cannot maintain his action; and this is called limitation of aſſize. Stat. Weſt. 1. See *Writ of* RIGHT and *Statutes of* LIMITATION *infra*, alſo INFORMATION.

There is no limitation with regard to the time within which any actions touching advowſons are to be brought; at leaſt, none later than the times of Richard I. and Henry III.; for by ſtatute 1 Mar. ſt. 2. c. 5. the ſtatute of limitations, 32 Hen. VIII. c. 2, is declared not to extend to any writ of right of advowſon, *quare impedit*, or aſſiſe of *darrein preſentment*, or *jus patronatus*. And this, ſays judge Blackſtone, upon very good reaſon, becauſe it may very eaſily happen, that the title to an advowſon may not come into queſtion, nor the right have an opportunity of being tried, within 60 years; which is the longeſt period of limitation aſſigned by the ſtatute of Henry VIII. See APPEAL and INDICTMENT.

LIMITATION *of Entry*. See ENTRY.

LIMITATION *of Eſtate*, in a legal ſenſe, imports how long the eſtate ſhall continue, or is rather a qualification of a precedent eſtate. As where one doth give lands to a man to hold to him and his heirs male, and to him and the heirs female, &c. here the daughters ſhall not have any thing in it, ſo long as there is a male; for the eſtate to the heirs male is firſt limited. Co. Litt. 313.

A limitation is denominated by Littleton (§ 380. 1 Inſt. 234.) a "condition in law." For where an eſtate is ſo expreſsly confined and limited by the words of its creation, that it cannot endure for any longer time than till the contingency happens, upon which the eſtate is to fail, this is denominated a "limitation;" as when land is granted to a man, *ſo long* as he is parſon of Dale, or while he continues unmarried, or *until* out of the rents and profits he ſhall have made 500*l.* and the like: (10 Rep. 41.) In ſuch caſe the eſtate determines as ſoon as the contingency happens, and the next ſubſequent eſtate, which depends upon ſuch determination, becomes immediately veſted without any act to be done by him who is next in expectancy. But when an eſtate is, ſtrictly ſpeaking, upon "condition in deed," (as if granted expreſsly *upon condition* to be void upon the payment of 40*l.* by the grantor, or *ſo that* the grantee continues unmarried, or *provided* he goes to York, &c. Rep. 41.) the law permits it to endure beyond the time when ſuch contingency happens, unleſs the grantor, or his heirs or aſſigns, take advantage of the breach of the condition, and make either an entry or a claim, in order to avoid the eſtate. (Litt. § 347. Stat. 32 Hen. VIII. c. 34.) Yet though ſtrict words of condition be uſed in the creation of the eſtate, if on breach of the condition the eſtate be limited over to a third perſon, and does not immediately revert to the grantor or his repreſentatives, (as if an eſtate be granted by A to B, on condition that within two years B intermarry with C, and on failure thereof then to D and his heirs,) this the law conſtrues to be a limitation and not a condition (1 Ventr. 202.); becauſe, if it were a condition, then upon the breach thereof, only A or his repreſentatives could avoid the eſtate by entry, and ſo D's remainder might be defeated by their neglecting to enter; but, when it is a limitation, the eſtate of B determines, and that of D commences, and he may enter on the lands the inſtant that the failure happens. So alſo, if a man by his will deviſes land to his heir at law, on condition that he pays a ſum of money, and for non-payment deviſes it over, this ſhall be conſidered as a limitation; otherwiſe, no advantage could be taken of the non-payment, for none but the heir himſelf could have entered for a breach of condition. Cro. Eliz. 201. 1 Roll. Abr. 411. Blackſt. Com. b. ii.

LIMITATION *of the Crown.* The ſtatutes 1 W. & M. cap. 8. 12 W. III. cap. 2. and 1 & 2 Ann. cap. 17. 4 Ann. cap. 8. &c. are acts for the limitation of the crown, and ſettling it on Proteſtant heirs in the houſe of Hanover. See CROWN.

LIMITATION, *Statutes of*, a ſpecies of plea in bar, in which a perſon may plead the time limited by certain acts of parliament, beyond which no plaintiff can lay his cauſe of action. This, by the ſtatute of 32 Hen. VIII. c. 2. in a writ of right is *ſixty* years; in aſſiſes, writs of entry, or other poſſeſſory actions real, of the ſeiſin of one's anceſtors, in lands; and either of their ſeiſin, or one's own, in rents, ſuits, and ſervices, *fifty* years; and in actions real for lands grounded upon one's own ſeiſin or poſſeſſion, ſuch poſſeſſion muſt have been within *thirty* years. By ſtat. 1 Mar. ſt. 2. c. 5. this limitation does not extend to any ſuit for advowſons. (See above.) But by the ſtatute 21 Jac. I. c. 2. a time of limitation was extended to the caſe of the king, *viz. ſixty* years precedent to 19th February, 1623. (3 Inſt. 183.); but this becoming ineffectual by efflux of time, the ſame date of limitation was fixed by ſtatute 9 Geo. III. c. 16. to commence, and be reckoned backwards, from the time of beginning any ſuit, or other proceſs, to recover the thing in queſtion; ſo that a poſſeſſion for *ſixty* years is now a bar even againſt the prerogative, in derogation of the ancient maxim "nullum tempus occurrit regi." By another ſtatute, 21 Jac. I. c. 16, *twenty* years are the time of limitation in any writ of formedon; and by conſequence, *twenty* years are alſo the limitation in every action of ejectment; for no ejectment can be brought, unleſs where the leſſor of the plaintiff is entitled to enter on the lands; and by the ſtatute 21 Jac. I. c. 16. no entry can be made by any man, unleſs within *twenty* years after his right ſhall accrue. Alſo, all actions of treſpaſs (*quare clauſum fregit*, or otherwiſe) detinue, trover, replevin, account, and caſe, (except upon accounts between merchants), debt on ſimple contract, or for arrears of rent, are limited by the ſtatute laſt-mentioned to *ſix* years, after the cauſe of action commenced; and actions of aſſault, menace, battery, mayhem, and impriſonment, muſt be brought within *four* years, and actions for words within *two* years after the injury committed. And by the ſtatute 31 Eliz. c. 5. all ſuits, indictments, and informations, upon any penal ſtatutes, where any forfeiture is to the crown alone, ſhall be ſued within *two* years, and where the forfeiture is to a ſubject, or to the crown and a ſubject, within *one* year after the offence committed; unleſs where any other time is ſpecially limited by the ſtatute. Laſtly, by ſtatute 10 W. III. c. 14, no writ of error, *ſcire facias*, or other ſuit, ſhall be brought to reverſe any judgment, fine, or recovery for error, unleſs it be proſecuted within *twenty* years. The uſe of theſe ſtatutes of limitation is to preſerve the peace of the kingdom, and to prevent thoſe innumerable perjuries which might enſue, if a man were allowed to bring an action for any injury committed at any diſtance of time. Upon both theſe accounts the law therefore holds, that "*intereſt reipublicæ ut ſit finis litium*," and upon the ſame principle the Athenian laws in general prohibited all actions, where the injury was committed *five* years before the complaint was made. If, therefore, in any ſuit, the injury or cauſe of action happened earlier than the period expreſsly limited by law, the defendant may plead the ſtatutes of limitations in bar; as upon an *aſſumpſit*, or promiſe to pay money to the plaintiff, the defendant may plead *non aſſumpſit infra ſex annos*; he made no ſuch promiſe within ſix years; which is an effectual bar to the complaint. Blackſt. Com. b. iii.

LIMITED FEES, denote ſuch eſtates of inheritance as are clogged or confined with conditions, or qualifications of any ſort. Theſe are of two ſorts, *viz. qualified* or *baſe-fees*, and *fees-conditional*, or *fees-tail*. See *Baſe*-FEES, and FEES-*tail*.

LIMITED *Problem*, is that which admits but of one ſolution, or which can only be ſolved one way: as to make a circle paſs through three points given, not lying in a right line, to deſcribe an equilateral triangle on a line given, &c. See PROBLEM, and DETERMINATE.

LIMITROPHOUS COLUMN. See COLUMN.

LIMITS, in *Mathematics*, a term ſometimes uſed, in general, for quantities, one of which is greater, and the other leſs than another quantity. Thus, in the quantities, a, x, b, if a be leſs than x, and b be greater than x, a and b are ſaid to be limits of x. The word occurs in this ſenſe, when we ſpeak of the limits of the roots of equations.

Sometimes a quantity is ſaid to be a limit between two others, when it is greater than the one and leſs than the other. So a ratio is ſaid to be a limit between two other ratios,

ratios, when it is greater than the one, and leſs than the other.

But limit is often uſed in a more reſtricted ſenſe; thus, when a variable quantity approaches continually to ſome determinate quantity, and may come nearer to it than to have any given difference, but can never go beyond it; then is the determinate quantity ſaid to be the limit of the variable quantity.

Hence, the circle may be ſaid to be the limit of its circumſcribed and inſcribed polygons; becauſe theſe, by increaſing the number of their ſides, can be made to differ from the circle leſs than by any ſpace that can be propoſed, how ſmall ſoever.

The limit of a variable ratio, is ſome determinate ratio, to which the variable ratio may continually approach, and come nearer to it than to have any given difference, but can never go beyond it. Hence, the ratio of the ordinate to the ſub-tangent of a curve, is ſaid to be the limit of the variable ratio of the differences of the ordinates, to the differences of the abſciſſæ.

The word limit, in this ſenſe, ſignifies the ſame as what ſir Iſaac Newton calls a firſt or prime, and a laſt or ultimate ratio.

There are two caſes of a variable quantity, or variable ratio, tending to ſuch a limit, as we have been deſcribing. In the firſt caſe, the variable quantity, or ratio, will not only approach to its limit within leſs than any given differences, but will actually arrive at its limit.

In the ſecond caſe, the variable quantity, or ratio, will only approach its limit within leſs than any given difference, but will never actually arrive at it.

Sir Iſaac Newton, to avoid the harſhneſs of the hypotheſis of indiviſibles, and the tediouſneſs of demonſtrations, according to the method of the ancients, by deductions *ad abſurdum*, has premiſed ſeveral lemmata, in the firſt ſection of the firſt book of his Principles, relating to the firſt and laſt ſums, and ratios of naſcent and evaneſcent quantities; that is, to the limits of ſums and ratios. This doctrine chiefly depends on the firſt of thoſe lemmata; the words of which are, "Quantitates ut & quantitatum rationes, quæ ad æqualitatem tempore quovis finito conſtanter tendunt, & ante finem temporis illius propius ad invicem accedunt quam pro data quavis differentia, fiunt ultimo æquales."

The learned gentlemen, who have written in defence of ſir Iſaac, againſt the author of the Analyſt, are not agreed among themſelves as to the preciſe meaning of this lemma. One of theſe gentlemen ſays, that the genuine meaning of this propoſition is, that thoſe quantities are to be eſteemed ultimately equal, and thoſe ratios ultimately the ſame, which are perpetually to each other, in ſuch a manner, that any difference, how minute ſoever, being given, a finite time may be aſſigned, before the end of which, the difference of thoſe quantities, or ratios, ſhall become leſs than that given difference. See Pref. State of the Rep. of Letters for Oct. 1735, and for Oct. 1736.

What ſir Iſaac Newton intends we ſhould underſtand by the ultimate equality of magnitudes, and the ultimate identity of the ratios propoſed in this lemma, will be beſt known from the demonſtration annexed to it. By that it appears, ſir Iſaac Newton did not mean that any point of time was aſſignable, wherein theſe varying magnitudes would become actually equal, or the ratios really the ſame; but only that no difference whatever could be named, which they ſhould not paſs. The ordinate of any diameter of an hyperbola, is always leſs than the ſame continued to the aſymptote; yet the demonſtration of this lemma can be applied, without changing a ſingle word, to prove their ultimate equality. The ſame is evident from the lemma immediately following, where parallelograms are inſcribed, and others circumſcribed to a curvilinear ſpace. Here the firſt lemma is applied to prove, that by multiplying the number, and diminiſhing the breadth of theſe parallelograms *in infinitum*, that is, perpetually and without end, the inſcribed and circumſcribed figures become ultimately equal to the curvilinear ſpace, and to each other; whereas, it is evident, that no point of time can be aſſigned, wherein they are actually equal; to ſuppoſe this were to aſſert, that the variation aſcribed to the figures, though endleſs, could be brought to a period, and be perfectly accompliſhed; and thus we ſhould return to the unintelligible language of indiviſibles. The excellence of this method conſiſts in making the ſame advantage of this endleſs approximation towards equality, as by the uſe of indiviſibles, without being involved in the abſurdities of that doctrine. In ſhort, the difference between theſe two may be thus explained.

There are but three ways in nature of comparing ſpaces: one is by ſhewing them to conſiſt of ſuch, as by impoſition on each other will appear to occupy the ſame place: another is, by ſhewing their proportion to ſome third; and this method can only be directly applied to the like ſpaces as the former; for this proportion muſt be finally determined by ſhewing when the multiples of ſuch ſpaces are equal, and when they differ: the third method to be uſed, where theſe other two fail, is by deſcribing upon the ſpaces in queſtion ſuch figures as may be compared by the former methods; and thence deducing the relation between thoſe ſpaces, by that indirect manner of proof, commonly called *deductio ad abſurdum*; and this is as concluſive a demonſtration as any other, it being indubitable, that thoſe things are equal which have no difference. Thus Euclid and Archimedes demonſtrate all they have written concerning the compariſon and menſuration of curvilinear ſpaces. The method advanced by ſir Iſaac Newton for the ſame purpoſe differs from their's, only by applying this indirect form of proof to ſome general propoſitions, and from thence deducing the reſt by a direct form of reaſoning. Whoever compares the fourth of ſir Iſaac Newton's lemmas with the firſt, will ſee, that the proof of the curvilinear ſpaces, there conſidered, having the proportion named, depends wholly upon this, that if otherwiſe the figure inſcribed within one of them, could not approach, by ſome certain diſtance, to the magnitude of that ſpace: and this is preciſely the form of reaſoning, whereby Euclid proves the proportion between the different circles. As this method of reaſoning is very diffuſively ſet out in the writings of the ancients; and ſir Iſaac Newton has here expreſſed himſelf with that brevity, that the turn of his argument may poſſibly eſcape the unwary, the reading of the ancients muſt be the beſt introduction to the knowledge of his method. The impoſſible attempt of comparing curvilinear ſpaces, without having any recourſe to the forementioned indirect method of arguing, produced the abſurdity of indiviſibles.

As the magnitudes, called in this lemma ultimately equal, may never abſolutely exiſt under that equality; ſo the varying magnitudes holding to each other the variable ratios, here conſidered, may never exiſt under that, which is here called the ultimate ratio. Of this ſir Iſaac Newton gives an inſtance, from lines increaſing together by equal additions, and having from the firſt a given difference. For the ultimate ratio of theſe lines, in the ſenſe of this lemma, as ſir Iſaac Newton himſelf obſerves, will be the ratio of equality, though theſe lines can never have this ratio; ſince no point of time can be aſſigned, when one does not exceed the other.

In like manner, the quantities called by ſir Iſaac Newton vaniſhing, may never ſubſiſt under that proportion here eſteemed their ultimate.

In the caſe of drawing tangents to curves, where the ordinate bears the ſame proportion to the ſubtangent, as that wherewith the difference of the ordinates, to the difference of the abſciſſæ, vaniſh; theſe lines muſt not be conceived, by the name of an evaneſcent, or any other appellation, ever to ſubſiſt under that proportion: for ſhould we conceive theſe lines, in any manner, to ſubſiſt under this proportion, though at the inſtant of their vaniſhing, we ſhall fall into the unintelligible notion of indiviſibles, by endeavouring to repreſent, to the imagination, ſome inconceivable kind of exiſtence of theſe lines between their having a real magnitude, and becoming abſolutely nothing. Sir Iſaac Newton was himſelf apprehenſive, that this miſtake might be made; for as he thought fit (in compliance with the bad taſte which then prevailed) to continue the uſe of ſome looſe and indiſtinct expreſſions reſembling thoſe of indiviſibles, for which he has himſelf apologized, he expreſsly cautions us againſt miſinterpreting him in this manner, when he ſays: ‘Si quando dixero quantitates quam minimas vel evaneſcentes, vel ultimas, cave intelligas quantitates magnitudine determinatas, ſed cogita ſemper diminuendas ſine limite.’’ Thus expreſsly has he declared to us, that vaniſhing quantities, or whatever other leſs accurate appellation he names them by, are to be conſidered as indeterminate quantities bearing to each other, under their different magnitudes, different proportions; which the quantities themſelves can never obtain, and the limit of theſe proportions is that, for the ſake of which theſe quantities are conſidered: inſomuch, that ſince theſe quantities have different proportions, while they obtain the name of vaniſhing quantities, the term ultimate is neceſſarily added to denote that proportion, which is the limit of an endleſs number of varying ones. The like remark is neceſſary, when theſe quantities are conſidered in the other light, as ariſing before the imagination: for then the proportion intended muſt be ſpecified, by calling it the firſt, or prime proportion of theſe quantities. And as this additional epithet is neceſſary to expreſs the proportion intended, ſo it is abſurd to apply it to the quantities themſelves; as ſir Iſaac Newton ſays, there are "rationes primæ quantitatum naſcentium," but not "quantitates primæ naſcentes." Philoſoph. Tranſactions, N° 342, p. 205.

So that, according to the author we have been quoting, all the examples given by ſir Iſaac in the before mentioned ſection, are to be underſtood of ſuch limits or ultimate ratios, as are never attained to by the quantities and ratios limited, but to which theſe may approach indefinitely, that is, ſo as to differ leſs than by a given quantity.

On the other hand, a learned gentleman, who aſſumed the name of Philalethes Cantabrigienſis, thinks that ſir Iſaac means, by the words of the lemma, and proves, in his demonſtration, not that the quantities or ratios are barely to be conſidered as ultimately becoming equal, or are to be eſteemed as ultimately equal; though, in reality, they can never have that proportion to each other; but that they do at laſt become actually, perfectly, and abſolutely equal. Preſ. State of the Republic of Letters for November 1735, p. 371.

He alſo diſtinguiſhes, as above, between quantities and ratios which arrive at their limits, and thoſe which do not. And it is inſiſted on, that every one of the examples given in the lemmata of this firſt ſection of the firſt book of ſir Iſaac's Principles, are of ſuch quantities and ratios as actually arrive at their reſpective limits; nor is there an inſtance there given of a quantity, or ratio, which never arrives at its limit, except one at the latter end of the ſcholium of this ſection (and that by way of illuſtration of a particular objection only) of two quantities, having a given difference, and being equally increaſed, *ad infinitum*, and whoſe ratio, it is admitted, never arrives at its limit. But decreaſing quantities may really and in fact be diminiſhed *ad infinitum:* for they may vaniſh and come to nothing. The ratio, therefore, of theſe, ſays he, may arrive at its limit; though that of the others cannot.

Neither are theſe learned gentlemen agreed as to the ſenſe of the word *vaniſhing* or *evaneſcent*, in the ſcholium of this firſt ſection of ſir Iſaac's Principles.

The queſtion is, whether the quantities that vaniſh are underſtood to ſpend ſome finite time in vaniſhing, or to vaniſh in an inſtant, or point of time; and conſequently, whether they bear one to another an infinite number of different ſucceſſive ratios during the vaniſhing, or one ratio only, at the point or inſtance of their evaneſcence.

This laſt is the ſenſe in which Philalethes takes the word evaneſcent, or vaniſhing; and the diſpute, on this head, as he obſerves, is of no other conſequence than to determine, whether the ſenſe in which he uſes the word be agreeable to ſir Iſaac Newton's. For, if the quantities vaniſh in an inſtant, I take the only ratio with which they vaniſh; or they ſpend a finite time in vaniſhing, and I take the laſt of the ratios, which they ſucceſſively bear to one another during that time; ſtill the ratio, taken in either of theſe caſes, will be one and the ſame. Preſent State of the Republic of Letters for November 1735, p. 383, 384.

We cannot pretend to give the whole detail of this controverſy, but muſt refer the curious to the Preſent State of the Republic of Letters for 1735. We ſhall only obſerve, that this diſquiſition is partly critical and partly ſcientifical. The critical inquiry is into the ſenſe of ſir Iſaac, ſo far as it may be determined from his own words; and here we cannot help thinking that this is ſomewhat doubtful. The other inquiry is about the true or ſcientifical notion, upon which this doctrine ought to be founded. With reſpect to which we ſhall only aſk two queſtions, which every reader may reſolve for himſelf, to wit, whether the conception or notion he has of the ratio or proportion of evaneſcent quantities, at the point or inſtance of their evaneſcence, be more clear and diſtinct than the notion of infiniteſimals? And whether the notion of inſcribed or circumſcribed polygons to any curve, attaining their laſt form, and thereby coinciding with their curvilinear limit, be more clear and diſtinct than the notion of polygons of an infinite number of ſides in the method of infiniteſimals?

Before we leave this ſubject, it may be proper to give the ſentiments of an eminent mathematician about the doctrine of limits, or of prime and ultimate ratios, and to ſhew the connection of this doctrine with that of fluxions. Mr. Maclaurin, in his Treat. of Flux., art. 502.

Sir Iſaac Newton conſiders the ſimultaneous increments of flowing quantities as finite, and then inveſtigates the ratio which is the limit of the various proportions which thoſe increments bear to each other, while he ſuppoſes them to decreaſe together til they vaniſh; which ratio is the ſame with the ratio of the fluxions. In order to diſcover this limit, he firſt determines the ratio of the increments in general, and reduces it to the moſt ſimple terms, ſo as that (generally ſpeaking) a part at leaſt of each term may be independent of the value of the increments themſelves; then, by ſuppoſing the increments to decreaſe, till they vaniſh, the limit readily appears.

For example, let a be an invariable quantity, x a flowing quantity, and o any increment of x: then the ſimultaneous increments of xx and ax will be $2xo + oo$ and ao, which are in the ſame ratio to each other as $2x + o$ is to a. This ratio of $2x + o$ to a continually decreaſes while o decreaſes, and is always greater than the ratio of $2x$ to a, while o is any real increment; but it is manifeſt, that it continually approaches to the ratio of $2x$ to a as its limit; whence it follows, that the fluxion of xx is to the fluxion of ax, as $2x$ is to a. If x be ſuppoſed to flow uniformly, ax will likewiſe flow uniformly, but xx with a motion continually accelerated; the motion with which ax flows, may be meaſured by ao; but the motion with which $2x$ flows is not to be meaſured by its increment $2xo + oo$, but by the part $2xo$ only, which is generated in conſequence of that motion; and the part oo is to be rejected, becauſe it is generated in conſequence only of the acceleration of the motion with which the variable ſquare flows, while o, the increment of its ſide, is generated; and the ratio of $2xo$ to ao is that of $2x$ to a, which was found to be the limit of the ratio of the increment $2xo + oo$ and ao. See FLUXION.

It is objected againſt ſir Iſaac Newton's method of inveſtigating this limit, that he firſt ſuppoſes that there are increments; that when it is ſaid *let the increment vaniſh*, the former ſuppoſition is deſtroyed, and yet a conſequence of this ſuppoſition, *i. e.* an expreſſion got by virtue thereof, is retained. But the ſuppoſitions that are made in this method of inveſtigating the limit are not ſo contradictory as this objection ſeems to import. He firſt ſuppoſes that there are increments generated, and repreſents their ratios by that of two quantities, one of which is given ſo as not to vary with the increments. If he had afterwards ſuppoſed that no increments had been generated, this indeed had been a ſuppoſition directly contradictory to the former. But when he ſuppoſes thoſe increments to be diminiſhed till they vaniſh, this ſuppoſition ſurely cannot be ſaid to be ſo contradictory to the former as to hinder us from knowing what was the ratio of thoſe increments, at any term of the time, while they had a real exiſtence; how this ratio varied, and to what limit it approached while the increments were continually diminiſhed: on the contrary, this is a very conciſe and juſt method of diſcovering the limit which is required.

It is to be obſerved, that the limiting, prime, or ultimate ratio of increments, ſtrictly ſpeaking, is not the ratio of any real increments whatſoever. But as the tangent of an arch is the right line that limits the poſition of all the ſecants that can paſs through the point of contact, though, ſtrictly ſpeaking, it be no ſecant; ſo a ratio may limit the variable ratios of the increments, though it cannot be ſaid to be the ratio of any real increments. The ratio of the generating motion may be likewiſe ſaid to be the laſt or ultimate ratio of the increments, while they are ſuppoſed to be diminiſhed till they vaniſh, for a like reaſon. It may juſt be added, that there being two caſes of variable quantities and ratios tending to a limit, it might have conduced to perſpicuity, and preventing diſputes, to have diſtinguiſhed theſe different limits by ſome addition. As in the firſt caſe to have called it a limit or ultimate ratio *incluſive;* becauſe the limit is the laſt of the quantities or ratios limited: and in the ſecond to have called it a limit or ultimate ratio *excluſive;* becauſe the quantities limited never attain to the limit, though they approach to it indefinitely.

This diſtinction may perhaps receive ſome farther illuſtration from the following example. It is known that the oſculatory circle is a circle that touches a curve ſo cloſely that no other circle can be drawn through the point of contact between them, all other circles paſſing within or without them both; and hence the oſculatory circle is ſuppoſed to have an equal curvature with the curve at that point. See Mr. Maclaurin's Flux. art. 394.

Now if we conceive the oſculatory circle at the end of the great axis of an ellipſis, it will fall entirely within the ellipſis; and the curvature of the ellipſis and oſculatory circle may both be ſaid to be limits of the curvatures of all the circles falling wholly within, and touching the ellipſis at the end of its great axis. But the term limit will not in both caſes have preciſely the ſame meaning; for the oſculatory circle is a limit *incluſive*, being the laſt of the circles limited; and the ellipſis is a limit *excluſive*, none of the circles limited ever coinciding with it. As to the circles which fall wholly without the ellipſis, and touch it at the end of its great axis, they have no limit *incluſive*, no circle touching the ellipſis ſo cloſely, that no other can paſs between; the only limit here is *excluſive*, the ellipſis itſelf.

The contrary of this happens at the end of the leſſer axis. At any other point of the ellipſis, one half of every oſculatory circle is a limit *incluſive* of the ſemicircles that fall within, and the other half is a limit *excluſive* of thoſe that fall without.

May we not aſk, if a curve is the limit of its inſcribed or circumſcribed polygons in any other ſenſe, than the curvature of the ellipſis is the limit of the curvatures of the circles before deſcribed, which approach nearer and nearer to the curve, but never coincide with it? It is true we hear it often ſaid, that the oſculatory circle is equicurval, and ſo coincides with the ellipſis; but this ſeems a conſequence of the language of infiniteſimals. It would be more accurate to ſay, that the curvature of the ellipſis is the limit *excluſive* of all the before mentioned circles, and that the oſculatory circle is their limit *incluſive*. That excellent geometer, Mr. Simſon, in his Conic Sections, lib. v. prop. 36. cor. ſays only, after demonſtrating the chief property of the oſculatory circle, that *eandem habere cum ſectione conica curvaturam dicitur*, giving this only as an appellation, but not as a propoſition. See on the ſubject of this article, Robins's Diſc. on Fluxions, in his Tracts, vol. ii.

LIMITS *of the Roots of an Equation.*—We have already obſerved, that by finding the limits of the roots of an equation, is to be underſtood the finding of two ſuch numbers, that one ſhall be greater and one leſs than the root required; by which means an approximation is evidently made towards the true root, and the nearer theſe limits approach towards each other, ſo much the more accurate will be the approximation. La Grange, in his "Traité de la Reſolution numerique des Equations," has carried the method of limits to its utmoſt poſſible perfection, by ſhewing, in all equations, how the limits of each of its roots may be aſcertained, and has ſhewn, that the method of approximation employed by Newton, and in fact every method, except that of his own, is defective in this reſpect, *viz.* that between the limits aſcertained in their operation, there may be one, two, or more roots, and conſequently, that they are not neceſſarily the limits of one root, but merely the limits between which one at leaſt of the real roots of the equation muſt lie. The nature of this article will not admit of our entering into an explanation of the proceſs of this celebrated analyſt; we can, therefore, only refer the reader to the work itſelf, and muſt content ourſelves in this place with giving a few of the moſt remarkable caſes relating to the limits of the roots of an equation.

1. If we can find two quantities, which, being ſubſtituted for the unknown quantity in any equation, give two reſults with contrary ſigns, then will theſe two quantities

be the limits of the value of x, that is, a value of x will always be found between theſe two quantities.

Let $x^m - A x^{m-1} + B x^{m-2} - C x^{m-3} + \&c. + N = 0$; and ſuppoſe that, by ſubſtituting any quantity p, inſtead of x, we have

$$p^m - A p^{m-1} + B p^{m-2} - C p^{m-3} + \&c. + N = R;$$

and by ſubſtituting another quantity, q, for it, we obtain

$$q^m - A q^{m-1} + B q^{m-2} - C q^{m-3} + \&c. N = - S:$$

then, I ſay, that there is at leaſt one real value of x between the limits p and q; that is, x is leſs than the former, and greater than the latter. The truth of the propoſition, however, is better demonſtrated from a partial than from a general example.

Let us, therefore, aſſume the equation

$$x^3 - 13 x^2 + 7 x - 1 = 0;$$

here, if we ſubſtitute $x = 2$, and $x = 20$, we have a reſult in the firſt caſe $= - 31$; and in the ſecond $= + 2939$; and it remains to be ſhewn that there is, at leaſt, one real value of x compriſed between theſe limits. For this purpoſe, the equation may be written

$$x^3 + 7 x - (13 x^2 + 1)$$

which quantity is found to be negative when $x = 2$; but poſitive when $x = 20$. That is, in the firſt caſe, we have

$$(x^3 + 7 x) < (13 x^2 + 1),$$

and in the latter

$$(x^3 + 7 x) > (13 x^2 + 1).$$

Now, it is obvious, that each branch of theſe expreſſions will increaſe as x is augmented, and that they will likewiſe be each diminiſhed as x is diminiſhed. Let us, therefore, conceive x, in the firſt caſe, to be ſucceſſively increaſed by any ſmall quantity, till it arrives at the value of x in the ſecond caſe. Then, ſince $x^3 + 7 x$, which was at firſt leſs than $13 x^2 + 1$, is now become greater than $13 x^2 + 1$, it muſt neceſſarily have paſſed through that ſtate, in which it was neither greater nor leſs; that is, the two branches muſt have paſſed through that ſtate in which they were equal; but when

$$x^3 + 7 x = (13 x^2 + 1),$$

we have alſo

$$x^3 - 13 x^2 + 7 x - 1 = 0;$$

and, conſequently, this value of x is a real root of the equation propoſed.

This reaſoning, though employed only in a particular caſe, is equally applicable to our general equation: for, by putting the poſitive part of the equation $= P$, and the negative $= Q$; alſo, ſuppoſing p to be that value of x which renders the reſult negative, or, which is the ſame, which gives $P < Q$; and q that value which makes $P > Q$, then we may conclude the ſame as above, that P, from being leſs than Q, having paſſed to that ſtate in which it is greater than Q, there muſt neceſſarily be a real value of x, between p and q, which renders $P = Q$; or the propoſed equation $= 0$. We may alſo aſcertain the limits of x between 0, and ſome real quantity, poſitive or negative. For example, in the general equation

$$x^m - A x^{m-1} \pm B x^{m-2} - C x^{m-3} \pm \&c. \pm N = 0,$$

it is obvious, that by taking $x = 0$, the reſult will be negative or poſitive, according as N is affected with the ſign $-$ or $+$. Therefore, if, in the firſt place, we find p ſuch that the reſult is poſitive, and $x = 0$, making it negative, a real value of x muſt lie between the limits p and 0. Again, the above equation may be converted into another, having the ſame roots, only with contrary ſigns, by writing $- y$ for x. And let us ſuppoſe, in the firſt place, that m is even, then the transformed equation will be

$$y^m + A y^{m-1} \pm B y^{m-2} + C y^{m-3} \&c. \pm N = 0;$$

and, conſequently, N will ſtill have, with regard to y^m, the ſame ſign, which, as above, we ſuppoſe to be negative; then, if q be ſuch as will give a poſitive reſult, and $x = 0$ giving a negative, it follows, that a real value of y will be found between the limits q and 0; and, conſequently, in the equation propoſed, a real root is compriſed between the limits $- q$ and 0.

But if the power m be odd, then the transformed equation will be

$$- y^m - A y^{m-1} \mp B y^{m-2} - C y^{m-3} \mp \&c. \pm N = 0,$$

$$\text{or,} \quad y^m + A y^{m-1} \pm B y^{m-2} + C y^{m-3} \pm \&c. \mp N = 0;$$

and, conſequently, y^m and $\mp N$, have not the ſame ſign with regard to each other. If, therefore, now, any value q can be found, ſuch that the reſult may be negative, a root of this equation will be found between the limits q and 0, and, therefore, in the original one between $- q$ and 0.

2. The greateſt poſitive root of an equation is always contained between the limits $S + 1$ and 0; S being the greateſt negative co-efficient that enters into the equation.

In order to prove this, we muſt demonſtrate that in any expreſſion

$$x^m \pm A x^{m-1} \pm B x^{m-2} \pm C x^{m-3} \&c. N.$$

The firſt term may be made to exceed the ſum of all the other terms. Now, it is obvious, in the firſt place, that the caſe which preſents the greateſt difficulty, is that in which all the co-efficients are made negative, and each equal to the greateſt; let, then, S be the greateſt negative co-efficient, it is to be demonſtrated, that ſuch a value of x may be found as will render

$$x^m > S\,(x^{m-1} + x^{m-2} + x^{m-3} + \&c. + 1).$$

Or, ſince the part within the parentheſis is equal to $\frac{x^m - 1}{x - 1}$ we have to ſhew, that we may find x ſuch, that

$$x^m > \frac{S\,(x^m - 1)}{x - 1}, \text{ or } x^m > \frac{S x^m}{x - 1} - \frac{S}{x - 1}.$$

Now, this will be manifeſtly the caſe, if we make

$$x^m = \frac{S x^m}{x - 1}, \text{ or } 1 = \frac{S}{x - 1}, \text{ or } x = S + 1.$$

It is therefore obvious, that this value, ſubſtituted for x in the propoſed equation, will give a poſitive reſult; whereas, $x = 0$ gives a negative reſult: therefore, from what is ſhewn above, a real value of x is found between the limits $S + 1$ and 0. If the foregoing equation be converted into another, with the ſigns of the roots changed, and if R in that equation be the greateſt negative co-efficient, then $- (R + 1)$, and 0, will be the limits alſo of the greateſt negative root.

It follows, immediately from what is ſhewn above, that every equation of even dimenſions, having its laſt term negative, has at leaſt two real roots, the one poſitive and the other negative.

It may alſo be readily demonſtrated, upon ſimilar principles, that every equation of odd dimenſions has at leaſt one real root; a truth which it is difficult to prove in any other manner. See La Croix's Elemens de Algebra, and La Grange's work above quoted.

Limits, in a *Military Senſe*, denote the diſtance which a centry is allowed on his poſt, *viz.* fifty paces to the right, and as many to the left; and though the weather be ever ſo bad, he muſt not get under cover.

Limits *of a Planet*, its greateſt excurſions or diſtances from the ecliptic. See Planet.

LIMITANEI, among the Romans, an appellation given to the ſoldiers who were ſtationed on the frontiers of the empire.

LIMITROTOPHI, among the Romans, the ſame with limitanei.

LIMMA, or Leimma, an interval of the *Greek Muſic*, which is a comma leſs than the ſemitone major, and, retrenched from a tone major, leaves behind the *Apotome;* which ſee.

' The ratio of the limma is 243 to 256, and is generated by beginning at C, and moving by 5ths to B; for then the quantity by which the neighbouring C exceeds B, is preciſely in the ratio which we have eſtabliſhed.

Philolaus, and all the Pythagoreans, made the limma a diatonic interval, which anſwered to our ſemitone major: for, after two conjunctive tones major, there remains only that interval to complete the true 4th, or tetrachord. So that, according to them, the interval from E to F was leſs than that from F to F𝄪. Our chromatic ſcale gives quite the contrary. Rouſſeau.

The abbé Rouſſier has given the muſical etymology of the word leimma, according to Ariſtoxenus. Mem. ſur la Muſ. des Anc. p. 142.

LIMMAT, in *Geography*, a river of Switzerland, which riſes in the Alps, about 11 miles S. of Glarus, aſſuming the name of Lint or Linth, and having paſſed Glarus and joined the Mat, near the lake of Wallenſtadt, takes the name of Limmat, and having traverſed the lake of Zurich, joins the Aar, three miles N. of Baden. The ſtream of this river is very rapid; its water beautifully tranſparent; and its borders, at firſt flat, afterwards gently riſing into hills clothed with paſture and wood, or divided into vineyards, and at laſt becoming quite perpendicular, and fringed to the water's edge with hanging trees. About a mile from Baden, where the Limmat flows with the greateſt rapidity, is a beautiful wooden bridge, 240 feet long, and ſuſpended about 20 feet from the ſurface of the water. It was the laſt work of Grubenman, the ſelf-taught architect, and is far ſuperior in elegance to that of Schaffhauſen.

LIMMEN, a town of Holland; 5 miles S. of Alcmaer.

LIMNÆUS, John, in *Biography*, an eminent German juriſt, was born at Jena in 1592, where his father was profeſſor of mathematics. Having received a good education in the elements of learning, he went to Weimar to purſue his maturer ſtudies, and from thence to the univerſity of his native place, where he remained till the death of his father in 1614, when he removed to Altdorf. In 1618, he engaged himſelf as travelling tutor to two young men of Nuremberg, whom he accompanied to France, England, and Holland. Having finiſhed his engagement with theſe, he took upon himſelf the office of private tutor to ſeveral young perſons of rank, among whom was Albert, margrave of Brandenburg. In proceſs of time, this prince gave him the poſt of chamberlain and member of his privy council. He died in the enjoyment of theſe offices in the year 1663. His works are numerous, and valued for their erudition. The chief are, "Tractatus de Academiis," 4to.; "Notitiæ Regni Galliæ," 2 vols. 4to.; "De jure imperii Romano-Germânici," 5 vols. 4to. Moreri.

LIMNER, corrupted from the French word *enlumineur*, a decorator of books with initial or other pictures. Johnſon.

LIMNIA, in *Botany*. See Claytonia.

LIMNING, (from *enluminer*, Fr. *to adorn books with paintings*). As theſe paintings, or illuminations, as they are called, were always done in water-colours, limning is never properly employed, except it be to deſignate that ſpecies of art, which is now commonly known by the name of miniature-painting, wrought in thoſe colours, and on paper; indeed, it is become almoſt obſolete, though, in the minds of the vulgar, it is ſometimes uſed to ſignify the art of painting generally, and more particularly *Portrait-painting;* which ſee. See alſo the articles Miniature and Water-colours.

LIMNITIS, a word uſed by the ancients to expreſs the concretion of round reeds, or water-plants, by ſome called *adarce:* or ſomewhat analogous to that.

LIMNOPEUCE, in *Botany*, from λιμνη, *a pool* or *lake*, and πευκη, *a pine-tree*, a name given by Vaillant to the *Pinaſtella* of Dillenius, *Hippuris* of Linnæus, in alluſion to its ſpiry ſhape and watery habitation. See Hippuris.

LIMNOPHILA, from λιμνη, *a pool* or *lake*, and φιλεω, *to love*, becauſe it inhabits ſuch places. Brown Prod. Nov. Holl. v. 1. 442. Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. *Scrophulariæ*, Juſſ.

Eſſ. Ch. Calyx tubular, five-cleft, equal. Corolla funnel-ſhaped; limb in five nearly equal ſegments. Stamens within the tube; anthers cohering in pairs. Stigma dilated, oblique. Capſule of two cells, and two deeply divided valves, the partition inſerted into that edge of the valves which burſts lateſt.

Herbs that inhabit marſhes, with oppoſite deep-cut leaves, moſtly divided into three parts to the baſe, which gives them the appearance of being whorled. Flower-ſtalks axillary, with two bracteas at the top.

The only ſpecies named by the author is

L. *gratioloides*. (Hottonia indica; Linn. Sp. Pl. 208. H. flore ſolitario ex foliorum alis proveniente; Burm. Zeyl. 121. t. 55. f. 1. Tsjudan-tsjera; Rheede Hort. Malab. v. 12. 71. t. 36.)—Gathered in the Tropical part of New Holland by Mr. Brown, who ſuſpects that ſeveral ſpecies are confounded by botaniſts under the above denomination, to be aſcertained by examination of them in a recent ſtate only. It is remarkable that the plant of the *Hortus Malabaricus* is ſaid to grow in a dry ſandy ſoil. See Hottonia.

LIMO. See Citrus.

LIMOCINCTI, among the Romans, a kind of prieſts, who officiated at public ſacrifices, and were dreſſed with a garment called *limus*.

LIMODORUM, in *Botany*, λειμοδωρον, a ſort of paraſitical plant, or rather, as it ſhould ſeem, ſome kind of tare, it being ſaid to choke or ſuffocate the *fænum græcum.* By this latter name we are not perhaps to underſtand literally the fenugreek or *Trigonella,* but may extend it to any other plant cultivated for hay in Greece, as more than one of the leguminous tribe are, or have been. Dodonæus applied this ancient name to the *Orobanche*, or Broom Rape; Cluſius to the *Orchis abortiva* of Linnæus; which at leaſt is what he deſcribed and intended, in his *Stirp. Pannon.* 241, though in his *Hiſtoria* a cut of *Ophrys Nidus-Avis* is, by miſtake, annexed to that deſcription. Linnæus, having referred the plant of Cluſius to the genus *Orchis*, adopted the name in queſtion for a new genus of the ſame natural order; but Swartz, in his excellent treatiſe on this order, having referred the Lin-mean *Limodorum* to his *Cymbidium*, very properly reſtores the name to the original plant of Cluſius, which proves diſtinct in genus from *Orchis*, as Tournefort had done before him. Cluſ. Hiſt. v. 1. 270. Tourn. t. 250. Swartz. Orchid. in Schrad. N. Journ. v. 1. 84. t. 1. f. 4. Ind. Occ. 1519. Willd. Sp. Pl. v. 4. 122.—Claſs and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*, Linn. Juſſ. Brown. Prodr. Nov. Holl. v. 1. 309.

Gen. Ch. reformed. *Cal.* Perianth of three, generally ſpreading, equal leaves, rarely reverſed. *Cor.* Petals two, generally ſmaller than the calyx-leaves. Nectary a ſpreading lip, undivided or lobed, concave at the baſe, projecting behind in a ſpur, various in figure and length. *Stam.* Anther an hemiſpherical, ſometimes pointed, terminal, deciduous lid, of two or four cells; maſſes of pollen ſtalked, in pairs. *Piſt.* Germen inferior, oblong, or obovate, nearly upright, furrowed; ſtyle ſemi-cylindrical, often gibbous, concave in front; ſtigma concave or convex, in the front of the ſtyle near the top. *Peric.* Capſule oblong, with three or ſix ribs, with one cell and three valves, opening by clefts between the ribs. *Seeds* numerous, minute, each clothed with a chaffy tunic, inſerted into the downy internal ridges of the valves.

Eſſ. Ch. reformed. Calyx-leaves ſomewhat ſpreading. Lip ſpreading, elongated at the baſe behind into a ſpur. Anther a terminal lid, deciduous.

Dr. Swartz enumerates twenty-one ſpecies, beſides a doubtful one, which is *Rodriguizia* of the Prodr. Fl. Peruv. et Chil. t. 25. Profeſſor Willdenow has twenty-ſeven ſpecies, for though he omits the ſix laſt of Swartz's, having, perhaps, not ſeen Schrader's New Journal, in which, and in its reimpreſſion the *Genera et Species Orchidearum*, only, they are deſcribed; he has added twelve others, which Swartz had only in part indicated as doubtful. All theſe are adopted by Willdenow from books; the ſix whoſe deſcriptions he had not ſeen, were all gathered by Dr. Afzelius at Sierra Leone.

This genus differs from *Cymbidium* in having a ſpur to the nectary, in whoſe cavity the honey is lodged. We have however already mentioned, (ſee CYMBIDIUM,) that this character, though apparently deciſive, is overſet by ſome nondeſcript *Orchideæ*, found by Dr. Buchanan in the Eaſt Indies. Theſe, by every mark, except the abſence or preſence of a ſpur in which they totally differ among themſelves, muſt form one genus, differing in habit from every thing already known; and we have little doubt that a critical examination of them recent, would be the means of detecting ſome over-ruling character, which would ſtamp this genus, independent of all that concerns the ſpur. In that caſe, the latter might ſtill remain a ſufficient diſtinction between *Limodorum* and *Cymbidium*.

Some remarkable ſpecies of *Limodorum* are

L. *Tankervilliæ.* Banks in Ait. Hort. Kew. ed. 1. v. 3. 302. t. 12. Andr. Repoſ. t. 426. Willd. n. 1. (Phaius grandifolius; Loureir. Cochinch. 529.)—Leaves radical, elliptic-lanceolate, pointed, ribbed, plaited. Stalk ſimple, many-flowered. Lip convoluted, with a very ſhort ſpur.—Native of China. It is treated in Europe as a ſtove plant, flowering in the ſpring. We firſt ſaw it at Lady Tankerville's in 1786, and it bloſſomed that year at Haerlem. The great ſize of the whole plant, which much exceeds that of any other of this natural order, whether wild or cultivated in Britain, and the ſplendidly contraſted colours of the *flowers*, render it much admired. The inſide of the calyx and petals is cinnamon-coloured, the outſide of the moſt brilliant poliſhed white; the nectary crimſon, often compared, though certainly inferior in beauty, to the foxglove.

L. *abortivum.* Willd. n. 26. (L. auſtriacum; Tourn. Inſt. 437. Orchis abortiva; Linn. Sp. Pl. 1336. Jacq. Auſtr. t. 193. Epipactis, n. 1288. t. 36. Hall. Helvet. v. 2. 148.)—Leaves none. Stalk with ſeveral tubular ſheaths. Flowers but little ſpreading. Lip wavy. Spur awl-ſhaped, the length of the germen.—Native of ſhady woods in Germany, Italy, the ſouth of France, and ſome parts of Switzerland, but rare even in that country of *Orchideæ*. That it has no right to a place in the Flora of Britain, though admitted by Ray and Hudſon, is now generally allowed. The miſtake aroſe from its being confounded in old books with *Orobanche cærulea*, Engl. Bot. t. 423, as is minutely explained at length in Tr. of Linn. Soc. v. 4. 164—169, and it appears that Lobel's *Orobanche major, e Gramontio luco Monſpellienſium*, Lob. Ic. v. 2. 269. f. 1, which is *Orobanche monſpeliaca floribus oblongis*, Ger. em. 1312, is certainly this *Limodorum*. The *root* conſiſts of two biennial cluſters of thick, cylindrical, divaricated fibres. The *ſtalk* is ſimple and ſolitary, eighteen to twenty-four inches high, clothed with a few cloſe purpliſh ſheaths, and terminating in a cloſe ſpike of rather large *flowers*, variegated with paler and deeper purple.

L. *Epipogium.* Willd. n. 27. (Epipogium; Gmel. Sib. v. 1. 11. t. 2. f. 2. Satyrium Epipogium; Linn. Sp. Pl. 1338. Jacq. Auſtr. t. 84. Epipactis, n. 1289. Hall. Helvet. v. 2. 149.)—Leaves none. Stalk ſheathed. Flowers few, pendulous, reverſed. Lip three-lobed, concave. Spur ovate, aſcending.—This ſingular and rare plant grows in ſome ſhady barren foreſts in Siberia, Germany, and Switzerland. Its pale hue and fleſhy habit, ſo like *Epipactis Nidus-Avis*, indicate its being a paraſitical attendant on the roots of trees. See EPIPACTIS, n. 9; and EPIPOGUM.

Dr. Swartz refers alſo to this ſame genus the *Cypripedium bulboſum*, Linn. Sp. Pl. 1347. Sm. Spicil. t. 11, a moſt curious plant, found in Lapland and Nova Scotia, of which very little is known; but the propriety of this meaſure is in our opinion very doubtful.

LIMODORUM, in *Gardening*, contains plants of the bulbo-tuberous-rooted herbaceous perennial kind, of which the ſpecies commonly cultivated are the tuberous-rooted limodorum (L. tuberoſum); the tall limodorum (L. altum); and the Chineſe limodorum (L. Tankervilliæ.)

Method of Culture.—Theſe plants are increaſed by planting the offsets from the roots in pots of bog-earth, and plunging them, in the firſt ſort, in a mild tan-pit, and in the others, in the tan hot-bed of the ſtove. The proper time of taking them off is when the plants are the moſt deſtitute of leaves.

But the two laſt ſorts ſhould have a loamy mould, and but little water in the winter ſeaſon. And the firſt requires the protection of a good green-houſe in winter, but the two laſt ſhould be kept in the bark-bed of the ſtove.

All theſe plants afford variety in green-houſe and ſtove collections.

LIMOGES, in *Geography*, a city of France, and capital of the department of the Upper Vienne; and before the revolution, the ſee of a biſhop. It is a place of conſiderable trade, and contains about 20,550 inhabitants, and 25,466 in the two cantons, on a territory of 292½ kiliometres, in 11 communes. N. lat. 45° 50′. E. long. 1° 20′.

LIMON, in *Botany*, Tourn. 397, the Lemon. See CITRUS *medica β*.

LIMON, in *Geography*, a ſmall iſland in the W. ſide of the gulf of Bothnia. N. lat. 60° 44′. E. long. 17° 9′.

LIMONA *de la Trou*, a town near the N. coaſt of the iſland of Hiſpaniola; 10 miles S.E. of Cape François.

LIMONE, a town of France, in the department of the

Maritime Alps; S. of Cani.—Alſo, a town of the iſland of Negropont; 20 miles S. of Negropont.

LIMONES, Grande, a town of the iſland of Cuba; 50 miles S. of Havanna.

LIMONEST, a town of France, in the department of the Rhône, and chief place of a canton, in the diſtrict of Lyons. The place contains 750, and the canton 11,089 inhabitants, on a territory of 77½ kiliometres, in 12 communes.

LIMONHE, a town of France, in the department of the Lot, and chief place of a canton, in the diſtrict of Cahors; 13 miles E. of Cahors. The place contains 1175, and the canton 9279 inhabitants, on a territory of 255 kiliometres, in 13 communes.

LIMONIA, in *Botany*, in its preſent application, evidently alludes to *Limon*, the lemon; the genus which is ſo denominated being next akin to *Citrus*, in characters, habit, and ſenſible qualities. The word therefore can have no reference to the λειμωνια of the Greeks, *Limonia* of the Romans, which is a ſpecies of *Anemone*, and derives its name from λειμων, *a meadow*.—Linn. Gen. 213. Schreb. 285. Willd. Sp. Pl. v. 2. 571. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 43. Juſſ. 261. Lamarck Illuſtr. t. 353. Gærtn. t. 58.—Claſs and order, *Decandria Monogynia*. Nat. Ord. *Aurantia*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, very ſmall, in from three to five, more or leſs deep, ſegments, permanent. *Cor.* Petals from three to five, oblong, obtuſe, erect, ſpreading at the ſummit. *Stam.* Filaments from ſix to ten, awl-ſhaped, erect, ſhorter than the corolla; anthers linear, erect. *Piſt.* Germen oblong, ſuperior; ſtyle cylindrical, the length of the ſtameas; ſtigma capitate, flat. *Peric.* Berry ovate, or nearly globoſe, of three cells, with membranous partitions. *Seeds* ſolitary, ovate.

Eſſ. Ch. Calyx in from three to five deep ſegments, inferior. Petals three to five. Berry of three cells. Seeds ſolitary.

Three ſpecies of this genus, all tropical ſpinous ſhrubs, and much reſembling orange trees in miniature, were known to Linnæus. Five without ſpines, adopted from Forſter, Lamarck and Retzius, are added by Willdenow. Two more from the Eaſt Indies, deſcribed by Dr. Roxburgh, one with and one without ſpines, are mentioned in Mr. Aiton's new edition.

Examples of the ſpinous ſpecies are

L. *monophylla*. Simple-leaved Thorny Limonia. Linn. Mant. 237. Roxb. Corom. v. 1. 59. t. 83. (Limones pumili zeylanici ſylveſtres; Burm. Zeyl. 143. t. 65. f. 1.) —Leaves ſimple. Spines ſolitary.—Native of the Eaſt Indies, in the extenſive foreſts of the coaſt of Coromandel, where it is called by the natives the Wild Lime. This is a *ſhrub* or ſmall *tree*, with alternate, ſtalked, ovate, entire, obtuſe, evergreen, ſhining *leaves*, full of pellucid dots, as are thoſe of all the reſt, and each accompanied by a ſharp axillary thorn. The *flowers* are white, in axillary cluſters. *Petals* four. *Stamens* ten, united into a firm hemiſpherical cup. *Berry* the ſize of a very ſmall gooſeberry, browniſh, of four cells, thickly coated.—Notwithſtanding the monadelphous ſtamens and ſimple leaves, this ſpecies has too entirely the habit of the reſt to be ſeparated from them.

L. *trifoliata*. Three-leaved Limonia. Linn. Mant. 237. Jacq. Ic. Rar. t. 463. Andr. Repoſ. t. 143.—Leaves ternate. Spines in pairs.—Native of the Eaſt Indies. It makes a pretty appearance in the ſtove, when decorated either with its white bloſſoms, which are three-cleft and hexandrous, or its ſcarlet berries, which are ſweet and pleaſantly acid. The *leaflets* are emarginate, the central one largeſt. *Branches* zigzag and ſlender.—When this ſhrub flowered ſome years ſince at Vienna, it anſwered ſo ill to the character of *Limonia*, in number of parts, that the celebrated Jacquin was near making a new genus of it, which he deſtined to honour an Engliſh botaniſt. There can be no doubt however that it belongs to *Limonia*. "Le petit citron doux" of Sonnerat, Voy. to New Guinea, 102. t. 63, is made a variety of this by Willdenow, who, judging by the figure, not the deſcription, improperly ſays it has no ſpines. The ſeſſile *leaves*, and ſolitary *flowers*, give it a different appearance.

Of the unarmed ſpecies are

L. *pentaphylla*. Five-leaved Limonia. Retz. Obſ. faſc. 5. 24. Roxb. Corom. v. 1. 60. t. 84.—Spines none. Leaves pinnate; leaflets elliptical, entire, two pair with an odd one.—Native of the Eaſt Indies. The *flowers* are ſmall and white, exquiſitely fragrant, in axillary branched cluſters. *Fruit* red, the ſize of a currant. *Stamens* ten, diſtinct, ſpindle-ſhaped.

L. *arborea*. Tree Limonia. Roxb. Corom. v. 1. 60. t. 85.—Spines none. Leaves pinnate; leaflets ſerrated, oblong, two pair with an odd one.—From the ſame country. The *flowers* are very numerous, in branched cluſters, fragrant. *Fruit* ſmall, brown. *Stamens* thread-ſhaped.

Limonia, in *Geography*, an iſland in the Mediterranean, about three miles long, and one broad; ſix miles W. of Rhodes. N. lat. 36° 27′. E. long. 27° 22′. On its eaſtern coaſt is a ſmall haven, defended by a ſhoal, on the margin of which ſtands the only village in the iſland. At ſome diſtance from Limonia is Narki, or Karki, anciently Chalcia, or Chalcis, which ſeems by ſeveral ſhoals that riſe above the waters to have formerly joined with Limonia.

LIMONIUM, in *Botany*, derived, as it appears, from λειμων, *a meadow*, (becauſe the plant occupies, to a great extent, low tracts of land on the ſea-ſhore,) is the old name for ſeveral ſpecies of Sea Lavender. (See Statice.) The ſame name has been alſo applied to the Red Valerian, to the Buck-bean, and even to the *Pyrola rotundifolia*. The latter indeed does grow on low ſandy commons in Holland, and near Yarmouth, but likewiſe in the moſt elevated heathy alpine places; nor, as far as we know, in ſcarcely any intermediate ſtation; for what is ſo named in books is often *P. minor*. The coincidence of alpine and maritime plants, found in no other ſituations, is a curious problem for the vegetable phyſiologiſt.

Limonium-*Gall*, in *Natural Hiſtory*, the name of a ſpecies of gall or vegetable protuberance, ſerving for the lodging of an inſect, affording a very beautiful appearance on the plant, and very common in the eaſtern parts of the world.

This of the limonium is ſingular, in that it is produced from a butterfly egg, and is inhabited by a true caterpillar. The butterfly depoſits her eggs on ſeveral parts of the leaves and ſtalks of this plant, and the young caterpillar, as ſoon as hatched, eats its way through the ſurface; and continuing to eat when within, his depredations occaſion an abundant derivation of juices to the part, by means of which a gall, or protuberance, is formed, which is ſuſtained by a pedicle, and in all reſpects reſembles a fruit. This is of a roundiſh figure, and by degrees grows to the ſize of a nutmeg. It is compoſed of ſeveral coats, or cruſts; the exterior ones are ſoft and ſpungy, but the interior are harder, and more woody than the galls of the oak. As the generality of other caterpillars feed on the ſubſtance of the leaves of trees and plants, this eats only the inſide of its lodgment; and nature ſo readily ſupplies this defect by new matter, that the cavity, in which it is lodged, is never found to be very great.

This ſeems the only known inſtance of a gall formed by a genuine caterpillar, the inhabitants of the willow galls, though uſually eſteemed ſmooth caterpillars, being not ſo, but the worms of a four-winged fly. Reaumur's Hiſt. of Inſects, vol. vi. p. 227.

LIMOSA, in *Ornithology*, the ſcolopax glottis of Linnæus, the name of a long-legged water-bird, common in Italy, and called by ſome *glottis*, and *pluvialis major*. See alſo SCOLOPAX *limoſa*, *fuſca* and *Fedoa*, *Tetanus*, &c. &c. and RECURVIROSTRA *Americana*.

LIMOSA, in *Ichthyology*, a name given by Salvian to the common mackarel, and in his figures to the *thynnus*, or tunny-fiſh, called the *Spaniſh mackarel*. See *Thynnus* SCOMBER.

LIMOSANO, in *Geography*, a town of Naples, in the county of Moliſe; 17 miles N.E. of Moliſe.

LIMOSELLA, in *Botany*, derived from *limus*, mud, from the circumſtance of its growing and thriving in muddy pools and ditches. For the ſame cauſe it has obtained the Engliſh appellation Mudwort.—Linn. Gen. 320. Schreb. 419. Willd. Sp. Pl. v. 3. 341. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 668. Ait. Hort. Kew. 2. 359. Brown Prod. Nov. Holl. 443. Juſſ. 96. Lamarck Illuſtr. t. 535. Gærtn. t. 50.—Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Preciæ*, Linn. *Lyſimachiæ*, Juſſ.

Gen. Ch. *Cal.* Perianth of one leaf, five-cleft, erect, acute, permanent. *Cor.* of one petal, bell-ſhaped, erect, equal, five-cleft, acute; diviſions ſpreading. *Stam.* Filaments four, erect, two of them adhering to the ſame ſide, ſhorter than the corolla; anthers ſimple. *Piſt.* Germen ſuperior, oblong, obtuſe; ſtyle ſimple, as long as the ſtamens, reclining; ſtigma globoſe. *Peric.* Capſule ovate, half covered by the calyx, of one cell and two valves. *Seeds* numerous, oval. *Recept.* ovate, very large.

Eſſ. Ch. Calyx five-cleft. Corolla five-cleft, equal. Stamens approaching each other in pairs. Capſule with one cell, two valves, and many ſeeds.

1. *L. aquatica.* Common Mudwort. Linn. Sp. Pl. 881. Engl. Bot. t. 357. Fl. Dan. t. 69. (Spergula perpuſilla lanceatis foliolis; Loes. Pruſ. 261. t. 81.)—Leaves lanceolate.—Found in muddy pools where water has been ſtanding. Dr. Abbot ſent it to Mr. Sowerby from Bedfordſhire, and Dr. Smith has gathered it on the Denes at Loweſtoft in Suffolk. It flowers in July and Auguſt.—*Root* annual, creeping. *Stems* proſtrate, cylindrical. *Leaves* radical, on long footſtalks, ſmooth, entire, not involute. *Flowers* ſmall, fleſh-coloured. *Calyx* ſomewhat irregular, acute, ſmooth. *Capſule* with a groove along its upper ſide.

2. *L. diandra.* Diandrous Mudwort. Linn. Mant. 252. Kœnig.—Leaves ſomewhat linear.—A native of the Eaſt Indies and the Cape of Good Hope.—The habit of this ſpecies is exactly ſimilar to that of the laſt, but the plant is only about a fourth as large in all its parts, ſo that it may be conſidered as one of the ſmalleſt of all plants. *Stems* creeping, ſhort. *Leaves* radical, linear, ſcarcely widening in the middle, obtuſe. Linnæus complains that on account of the minuteneſs of the *flowers* he could not deſcribe them from a dried ſpecimen, but that the acute diſcoverer of this ſpecies, Kœnig, found them to be diandrous.

3. *L. auſtralis.* New Holland Mudwort. Brown. Prod. Nov. Holl. 443.—Leaves ſpatulate linear.—We know nothing of this ſpecies, but we inſert it, on the authority of Mr. Brown, as a native of New Holland, who juſtly obſerves that all the ſpecies ſtand in need of further inveſtigation.

LIMOURS, in *Geography*, a town of France, in the department of the Seine and Oiſe, and chief place of a canton, in the diſtrict of Verſailles; nine miles S. of Verſailles. The place contains 858, and the canton 7304 inhabitants, on a territory of 147½ kiliometres, in 14 communes.

LIMOUX, a town of France, and principal place of a diſtrict, in the department of the Aude. N. lat. 43° 3'. E. long. 2° 18'. The place contains 5142, and the canton 12,556 inhabitants, on a territory of 240 kiliometres, in 23 communes.

LIMPET, in *Conchyliology*. See PATELLA and CONCHOLOGY.

LIMUS, among the Romans, a garment reaching to the ground, and worn by the prieſts, who on that account were called *limocincti*.

LINACAGAN, in *Geography*, one of the iſlands in the Eaſt Indian ſea, called Calamianes. N. lat. 11° 40'. E. long. 120° 10'.

LINACRE, THOMAS, in *Biography*, an eminent phyſician, and one of the moſt elegant ſcholars of his age, was born at Canterbury about the year 1460. Having completed his ſchool education, under a very eminent maſter, in his native city, he entered at Oxford, and was choſen fellow of All-Souls' college in 1484. His deſire of farther advancement in learning induced him to accompany his former ſchoolmaſter, De Selling, into Italy, whither the latter was ſent on an embaſſy to the court of Rome by Henry VII. De Selling left him at Bologna, with ſtrong recommendations to Angelo Poliziano, who was at that time accounted one of the moſt elegant Latiniſts in Europe; but whom our young ſtudent, by his aſſiduous application, at length excelled in the purity of his ſtyle in that language. At Florence, Linacre had the good fortune to acquire the favour of that munificent patron of literature, Lorenzo de Medicis, who granted him the privilege of attending the ſame preceptors with his own ſons. He knew how to profit by ſuch an opportunity; and under Demetrius Chalcondylas, who had fled from Conſtantinople when it was taken by the Turks, he acquired a perfect knowledge of the Greek language. Thus accompliſhed in claſſical learning, he went to Rome, and ſtudied medicine and natural philoſophy under Hermolaus Barbarus. He applied particularly to the works of Ariſtotle and Galen, and is ſaid to have been the firſt Engliſhman who was well acquainted with thoſe writers in the original Greek. On his return to England, he took the degree of doctor of phyſic at Oxford, and gave lectures on phyſic and taught the Greek language in that univerſity. His reputation ſoon became ſo high, that king Henry VII. called him to court, and entruſted him with the care both of the health and education of his ſon, prince Arthur. He is ſaid alſo to have inſtructed princeſs Catherine in the Italian language. He was made ſucceſſively phyſician to the kings Henry VII., Henry VIII., and Edward VI., and to the princeſs Mary.

In the reign of Henry VIII., indeed, he appears to have ſtood above all rivalſhip at the head of his profeſſion; and he evinced his attachment to its intereſts, as well as to the public good, by various acts; but eſpecially by founding two lectures on phyſic in the univerſity of Oxford, and one in that of Cambridge, and by obtaining the inſtitution of the Royal College of Phyſicians in London. He ſaw with concern, that the practice of medicine was chiefly engroſſed by illiterate monks and empirics, licences being eaſily obtained by improper perſons, when the biſhops were authoriſed to examine and licenſe practitioners in an art of which they could not be competent judges. Through the intereſt of cardinal Wolſey, therefore, Linacre obtained letters patent in 1518 from Henry VIII., conſtituting a corporate body of regularly bred phyſicians in London, in whom was veſted the ſole right of examining and admitting perſons to practiſe within the city, and ſeven miles round it; and alſo of licenſing practitioners throughout the whole kingdom, except ſuch as were graduates of Oxford or Cambridge, who by virtue of their degrees were independent of the college, except within London and its precincts. The college had likewiſe authority given to it to examine preſcriptions and drugs in apothecaries' ſhops. Linacre was the firſt preſident of the new college, and continued in the office during the remaining ſeven years of his life; and, at his death, he bequeathed to the college his houſe in Knight-rider-ſtreet, in which its meetings were held. There is no doubt that this inſtitution greatly contributed to the credit and dignity of the medical profeſſion in the metropolis, and many juſtly celebrated names are enrolled among its members. In proceſs of time, however, its foundation became narrowed, and it fell into the uſual monopolizing ſpirit of a corporation, whilſt its powers to controul the audacity of empirical impoſtors (the principal object of its eſtabliſhment) have ſunk into total diſuſe.

Towards the latter part of his life, in the year 1519, Linacre entered into holy orders; a ſtep to which, it would ſeem, he was principally induced, from a deſire to obtain a ſtudious and eaſy retirement, at a time when he became exceedingly afflicted with that painful diſeaſe, the ſtone, which greatly incapacitated him for buſineſs, and at length put an end to his life. Sir John Cheke relates that, not long before his death, when worn out by ſickneſs and fatigue, he firſt began to read the New Teſtament; and that when he had peruſed the fifth, ſixth, and ſeventh chapters of St. Matthew, he threw the book from him with violence, exclaiming, "either this is not the goſpel, or we are not Chriſtians!" a declaration, if rightly underſtood, equally honourable to the morals he found there inculcated, and ſatirical to thoſe of the age. He died in great agonies from the ſtone, on the 20th of October, 1524, at the age of ſixty-four, and was buried in St. Paul's cathedral, where a monument was afterwards erected to his memory by his admirer and ſucceſſor in fame, Dr. Caius.

In his literary character, Linacre ſtands eminently diſtinguiſhed; inaſmuch as he was one of the firſt, in conjunction with Collet, Lilly, Grocin, and Latimer, who revived, or rather introduced, the learning of the ancients in this iſland. Tranſlations from the Greek authors into Latin were the chief occupations of the literati of thoſe times; and Linacre conferred a benefit on his profeſſion, by tranſlating ſeveral of the moſt valuable pieces of Galen. Theſe were the treatiſes, "De Sanitate tuenda," in ſix books, which was printed at Cambridge in 1517, and dedicated to king Henry VIII.; "De Morbis curandis," in fourteen books, printed at Paris in 1526; three books, "De Temperamentis," and one "De inæquali Temperie," firſt printed at Cambridge in 1521, and inſcribed to pope Leo X.; "De naturalibus Facultatibus," three books, together with one book "De pulſuum Uſu," the firſt time of printing, which is unknown, but they were reprinted by Colinæus in 1528, as well as his poſthumous tranſlation of the four books "De Morborum Symptomatibus." In theſe verſions Linacre exhibited a Latin ſtyle ſo pure and elegant, as ranked him among the fineſt writers of his age: it was laboured, indeed, with that ſolicitude of correctneſs, which beſpoke a Latiniſt formed in the Italian ſchool of that time. His friend Eraſmus deſcribes him as "Vir non exacti tantum, ſed ſeveri judicii;" and Huet, in his learned treatiſe "De claris Interpretatoribus," gives him the praiſe of extraordinary elegance and chaſteneſs of ſtyle, but intimates that he occaſionally ſacrifices fidelity to theſe qualities.

It was, indeed, on his reputation as a philologiſt, that he ſeems chiefly to have valued himſelf. His firſt eſſay was a tranſlation of "Proclus on the Sphere," dedicated to his pupil, prince Arthur; and he alſo wrote a ſmall book of the rudiments of the Latin Grammar, in Engliſh, for the uſe of the princeſs Mary, which was afterwards tranſlated into Latin by the celebrated Buchanan. But the work which appears to have engaged a very large portion of his time, and was univerſally acknowledged to be a work of the moſt profound erudition, was a larger grammatical treatiſe, entitled "De emendata ſtructura Latini Sermonis, libri ſex." This work, which was not printed till after his death, in December 1524, when it appeared with a recommendatory letter from the learned Melancthon, was received with much applauſe by men of erudition, and paſſed through ſeveral editions: it was too complex however, and too profound in metaphyſical diviſions, and in the philoſophy of language, for popular uſe. His friend Eraſmus, indeed, in his "Moriæ Encomium," beſtowed ſome good-natured raillery upon the author, for having tortured himſelf for twenty years by the ſubtleties of grammar, and, after forſaking other more important objects, thought himſelf happy in living long enough to eſtabliſh certain rules for diſtinguiſhing the eight parts of ſpeech.

In his profeſſional character, Linacre acquired univerſal reputation, among his countrymen and contemporaries, for ſkill and practical ability, as well as for his learning; and he was equally the ſubject of applauſe and eſtimation as an upright and humane phyſician, a ſteady and affectionate friend, and a munificent patron of letters. It were ſufficient of itſelf to juſtify this eulogium, to mention that he was the intimate friend of Eraſmus. That great and worthy man frequently takes occaſion to expreſs his affection and eſteem for his character and abilities; and writing to an acquaintance, when ſeized with an illneſs at Paris, he pathetically laments his abſence from Linacre, from whoſe ſkill and kindneſs he might receive equal relief. The following epitaph, written by Caius, will be acceptable to the learned reader from the elegance of its compoſition.

"Thomas Lynacrus, Regis Henrici VIII. medicus; vir et Græcè et Latinè, atque in re medica longe eruditiſſimus. Multos ætate ſua languentes, et qui jam animam deſponderant, vitæ reſtituit. Multa *Galeni* opera in Latinam linguam, mira et ſingulari facundia, vertit. Egregium opus de emendata ſtructura Latini ſermonis, amicorum rogatu, paulo aute mortem edidit. Medicinæ ſtudioſis *Oxoniæ* publicas lectiones duas, *Cantabrigiæ* unam, in perpetuum ſtabilivit. In hac urbe Collegium Medicorum fieri ſua induſtria curavit, cujus et Præſidens proximus electus eſt. Fraudes doloſque mirè peroſus; fidus amicis; omnibus juxta charus: aliquot annos antequam obierat Preſbyter factus; plenus annis, ex hac vita migravit, multum deſideratus, anno 1524, die 21 Octobris. Vivit poſt funera virtus. Thomæ Linacro clariſſimo Medico, Johannes Caius poſuit, anno 1557. See Aikin's Biog. Memoirs of Med. Freind's Hiſt. of Phyſic. Gen. Biog.

LINAGROSTIS, in *Botany*, from λινον, *thread*, and αγρωστις, *graſs*, the old name of the Cotton-graſs. See ERIOPHORUM.

LINARES, in *Geography*, a town of Spain, in the kingdom of Jaen, ſix leagues from the Sierra Morena; only remarkable for a fountain with many jets, and the remains of a Roman aqueduct, by which water was conveyed to the ancient Caſtelo, now Cazlona. In the neigbourhood are very rich lead mines, and one of a ſemi-metal, with which the emerald tint is given to porcelain. Two leagues from this town there is a ſilver mine, famous in the time of the Carthaginians, which belonged to the beautiful Himilca, wife of Aſdrubal. The Romans alſo worked this mine. It has a ſhaft 2000 feet deep, into which numerous galleries open. It was long neglected; but re-opened in the 17th century, when a vein of ſilver was found five feet broad: however, it has ſince been diſregarded. It belongs to the town of Bäeza.

LINARIA, in *Botany*, ſo called from having the habit and foliage of *Linum*, or Flax, is the Toad-flax. (See ANTIRRHINUM.) The French botaniſts are partial to the name, though certainly none of the beſt; and as they divide the genus, retain *Antirrhinum* for ſuch ſpecies only as have no ſpur.

LINARIA, in *Ornithology*. See FRINGILLA and LINNET.

LINARYD, in *Geography*, a town of Sweden, in the province of Smaland; 11 miles S.S.E. of Wexio.

LINATO, a town of Italy, in the department of the Olona, on the Lambro; 5 miles S.E. of Milan.

LINBO, a ſmall iſland in the Adriatic. N. lat. 44° 37′. E. long. 14° 57′.

LINCH-CLOUT, in *Artillery*, the flat iron under the ends of the arms of an axle-tree, to ſtrengthen them, and diminiſh the friction of the wheels. See CLOUTS.

LINCH-*Pin*, in *Rural Economy*, the ſmall pin, in carts or other carriages, that is put upon the end of the axle-trees, to confine the wheels on them in a ſteady manner. See LINSPINS.

LINCHANCHIA, in *Geography*, a town of Mexico, in the province of Yucatan; 25 miles N. of Merida.

LINCKIA, in *Botany*, ſo called by Micheli, in honour of John Henry Linck, an apothecary at Leipſic, fellow of the Royal Society of London, who died in 1734, at the age of 60. He wrote an account of the coffee-tree, from one which flowered in a garden near his reſidence, in 1724, and his treatiſe may be ſeen in the *Ephemerides* of the Acad. Naturæ Curioſorum, v. 1. 204. He is alſo the author of a ſplendid work in folio, on the ſpecies of Star-fiſh, *Aſterias*. The plant to which Micheli has given his name, ſee Mich. Gen. 126. t. 67, is *Tremella Noſtoc* of Linnæus. See TREMELLA.

LINCOLN, an ancient city in the county of that name, England, and a place of conſiderable importance in the eccleſiaſtical and military annals of the kingdom, is ſingularly ſituated on the top and ſide of an eminence, which ſlopes with a ſteep deſcent to the ſouth, where the river Witham runs at its baſe. A large portion of the city, or rather ſuburbs, extends, in a long ſtreet, from the foot of the hill to the ſouth. On the northern ſide of it, without the walls, is another ſuburb, called Newport, ſuppoſed to have been an outwork of the Roman ſtation. Camden, and ſome other antiquaries, ſtate, that this place was occupied as a ſtation, or ſtrong hold, by the Britons, anterior to the Roman colonization of the iſland; and that then it bore the name of "Lindcoit, from the woods (for which ſome copies have, corruptly, Lintcoit)." By Ptolemy and Antoninus the name of the place is written Lindum; and, from having the privilege of a colony, it was called Lindum colonia. As a military ſtation, occupied by a colony of Romans, it muſt have been a place of ſome extent and conſequence. This is evident from the veſtiges that remain, and from the various diſcoveries that have been made at different periods. The form of the fortified ſtation was that of a parallelogram, divided into four equal parts by two ſtreets, which croſſed it at right angles. At the extremities of theſe were four fortified gates, nearly facing the four cardinal points. The whole was encompaſſed by an embattled wall, which, on three ſides, was flanked by a deep ditch, but on the ſouth ſide the ſteepneſs of the hill rendered a foſs unneceſſary. The area, thus incloſed, was about 1300 feet in length by 1200 in breadth, and is eſtimated to have contained thirty-eight acres. The walls have been levelled with the ground; and three of the gates have been long ſince demoliſhed. The remaining gate, to the north, which is called Newport gate, is deſcribed by Dr. Stukeley as "the nobleſt remnant of this ſort in Britain, as far as I know;" and he expreſſes much ſurpriſe, that it had not "been taken notice of" before his time. The great or central gateway has a ſemi-circular arch, ſixteen feet in diameter, formed with twenty-ſix large ſtones, apparently without mortar. The height is twenty-two feet and a half, of which eleven are buried beneath the ground. On each ſide of the arch are ſeven courſes of horizontal ſtones, called ſpringers, ſome of which are from ſix to ſeven feet in length. On each ſide of the arch are two ſmall lateral doorways or poſterns. A maſs of the old Roman wall is ſtill to be ſeen eaſtward of this gate; and to the weſt is another large maſs, called the mint-wall, which was about ſixteen feet high and forty feet long, and had ſcaffold-holes and marks of arches. Mr. Gough ſuppoſed this to be part of a Roman granary. Southward of the ſtation above deſcribed were other Roman works, which extended from the brow to the bottom of the hill. It appears that a fortified wall, with towers at the corners, continued from the top to the bottom of the hill, where it turned at right angles by the ſide of the river. Theſe fortifications underwent ſeveral alterations and additions, during the various wars to which the place was ſubjected. Hence it is very difficult, if not wholly impoſſible, to define what is really of Roman origin, or of Saxon or Norman workmanſhip. It is equally perplexing to aſcertain the time of eſtabliſhing the firſt colony here forming the ſtation, building the walls, or extending the city. Various coins and other remains of antiquity have been diſcovered here. In 1739, three ſtone coffins were found at the ſouth-weſt corner of the cloſe, near the Chequer gate. Beneath theſe was a teſſellated pavement, and under that a Roman hypocauſt. A ſimilar diſcovery was made in 1782. In the tenth volume of the Archæologia is a deſcription of an ancient place of ſepulture, diſcovered in an open field, half a mile from the eaſt gate of the ancient Lindum. In 1790 was found, about three or four feet below the ſurface, a very curious ſepulchral monument, evidently Roman, and of ſome perſon of high rank. Many fragments of antiquity were preſerved by the Rev. Dr. Gordon, the precentor of the cathedral, who gives an account of ſeveral earthen and glaſs urns, which were diſcovered in the ſame field, ſome of which were of ſingular ſhape. He alſo deſcribes a room, twenty feet by ſixteen, which was diſcovered in a quarry. The ſame field having been broken up for the purpoſes of quarrying, ſeveral ſtone coffins of various ſhapes have at different times been diſcovered in the looſe ground, which covers a ſubſtratum of rock. From theſe, and from other circumſtances, it is highly probable that this was a Roman burial-ground.

Soon after the Romans quitted the iſland, Lincoln, in common with other places of conſequence, ſhared in the general calamities which enſued by the incurſions of the Picts, Saxons, and Danes. At what period the Saxons firſt poſſeſſed themſelves of this city does not appear in hiſtory: but early in the ſixth century we find Arthur, king of Britain, obtaining great advantages over the combined forces of the two Saxon chiefs, Colgern and Cerdic, and compelling them to relinquiſh the ſiege of Lincoln. In thoſe ſtruggles the old town was nearly deſtroyed, and, as Leland ſuppoſes, “ new Lincoln was made out of a piece of old Lincoln.” The Saxons, for their better ſecurity, fortified the ſouthern part of the hill with ditches and ramparts, walled the town, and erected gates. At the time of the Norman conqueſt, Lincoln appears to have been one of the richeſt and moſt populous cities in England: and of great importance as an emporium of trade and commerce. The Domeſday Survey mentions 1070 manſions, 900 burgeſſes, and 12 lagemen, having ſac and ſoke. On the acceſſion of the Conqueror to the throne, he ordered four ſtrong caſtles to be built; of which one was to be at Lincoln. In conſequence of this, a large and ſtrong caſtle was erected on the ridge of the hill, on which this city was ſituated. The building was 644 yards in circumference, and occupied the ſpace on which it is aſſerted that 166 houſes had ſtood; 74 more were at the ſame time demoliſhed without the limits, that the whole might be inſulated. In the reign of Henry I. a navigable canal was made, or enlarged, from the river Witham at Lincoln to the Trent near Torkſey; and was probably the firſt canal of the ſort ever made in England. This was about ſeven miles in length, and is at preſent called the Foſs-dyke. By this a communication was formed with the Trent, and down that by the Humber to the ſea. Being thus acceſſible for foreign veſſels, and having alſo the advantage of an inland navigation, the city became populous and wealthy; and, according to Alexander Necham, a poet of that age, “ Lincoln was now ſtored with good things, and became the ſupport of the neighbouring country.” At this period, it appears to have poſſeſſed a large ſhare of the import and export trade of the kingdom. When, in the year 1140, the empreſs Maud came to England to aſſert her title to the crown, ſhe took up her reſidence at Lincoln, as a place of ſafety, and conveniently ſituated for communication with her friends. Stephen hearing of it marched quickly thither, cloſely beſieged the city, and took it: but the empreſs had eſcaped. The king, having poſſeſſed himſelf of the city, appeaſed the tumults of the neighbourhood, and finding the country quiet, left a garriſon, and proceeded to his army, acting in other parts of the kingdom. During the conteſt between the empreſs and Stephen, Lincoln acquired great notoriety; and thence obtained a degree of conſequence in the eſtimation of future monarchs. After Henry II. had been crowned in London, he was afterwards, according to Speed, crowned at Lincoln in the year 1155. We find this city and its caſtle materially concerned in the contentions between king John and the aſſociated barons. The caſtle and bail of Lincoln appear to have continued in the occupation of the crown till the time of Edward I., when Henry de Lacy died ſeiſed of them, and they paſſed, with other parts of his inheritance, to the earl of Lincoln, and ſo became annexed to the duchy of Lancaſter. John of Gaunt, duke of that palatinate, greatly improved the caſtle, and made it his ſummer reſidence; having, according to a local tradition, built himſelf a winter palace below the hill, in the ſouthern ſuburbs. Several parliaments were held at Lincoln in the reigns of Edward I. II. and III. In the year 1348, the contracted ſpirit of monopoly ſo far prevailed here, againſt the acts of parliament paſſed in the years 1335 and 1337, and the king's reſolutions to foſter the woollen manufactures, that the weavers of Lincoln obtained a grant from Edward III., of what they conſidered and called their *liberties*. By this charter they were inveſted with the power of depriving any weaver not of their guild, of the privilege of working at his trade within twelve leagues of the city. This and other ſimilar monopolies were aboliſhed in 1351, by an act called the *Statute of Cloths*. In the following year, the ſtaple of wool was removed from Flanders to England; and Lincoln was one of the ſtaple towns appointed on that occaſion. It was alſo made a ſtaple for leather, lead, and various other articles. This proved highly beneficial to the place, for it thereby recovered from the loſſes it had ſuſtained by military ravages, and was ſoon reſtored to a flouriſhing condition. At the commencement of hoſtilities between Charles I. and his parliament, the king came to Lincoln, and convened the nobility and freeholders of the county.

The dioceſe of Lincoln, after the ſee was removed from Sidnaceſter, ſoon acquired a vaſt accumulation of territorial juriſdiction and wealth. It included ſo many counties, that it was deſcribed as ready to ſink under the incumbent weight of its own greatneſs; and though Henry II. took out of it the dioceſe of Ely, and Henry VIII. thoſe of Peterborough and Oxford, it is ſtill conſidered the largeſt in England. As the juriſdiction was great, ſo, prior to the reformation, the revenues were proportionably abundant. Except the two archbiſhoprics, and thoſe termed the principality biſhoprics, Wincheſter, Durham, and Ely, no ſee was ſo well endowed, which was the reaſon that there is no record, prior to the time of Elizabeth, of any biſhop of this ſee having been tranſlated to another, except Wincheſter; though ſince that time, Willis obſerves, “ no leſs than ten out of ſeventeen have left this for more valuable ones.” Nor was it leſs remarkable for the number of epiſcopal palaces within the dioceſe. Previous to the year 1547, it had eight. In this county, Lincoln, Sleaford, and Nettleham; in Rutlandſhire, Ledington; in Huntingdonſhire, Buckden, the uſual reſidence of the biſhops; in Buckinghamſhire, Woburn and Finghurſt; in Oxfordſhire, Banbury Caſtle: there were alſo two others at Newark in Nottinghamſhire; and Lincoln Place, Chancery Lane, London. All theſe, except that at Lincoln, with about thirty manors, were given up, in the firſt year of Edward VI., by Holbech, the firſt married biſhop; who, in order to gratify the wiſhes of ſome courtiers, and to raiſe his own family, exchanged almoſt every ſpecies of landed property annexed to the ſee for impropriations; ſo that now only four manors remain of the ancient demeſnes. The preſent revenues, therefore, principally ariſe from rectorial property or tythes.

The cathedral is not only the moſt prominent object of this city, but is the moſt intereſting as a ſubject of hiſtory, antiquity, and art. This magnificent ſtructure, from its ſituation on the ſummit of a hill, and from the flat ſtate of the country to the ſouth-eaſt and ſouth-weſt, may be ſeen at the diſtance of twenty miles. Raiſed at a vaſt expence, by the munificence of ſeveral prelates, it diſcovers, in many parts, ſingular ſkill and beauty, particularly in its weſtern front, which muſt attract the attention of every traveller. The ſee being tranſlated from Dorcheſter to Lincoln in 1088, St. Remigius de Feſcamp, the firſt biſhop, founded a cathedral church, which was ſo far advanced in the courſe of four years as to be ready for conſecration. All the biſhops of England were ſummoned to attend on that occaſion. Remigius died two days before the intended ſolemnity. His ſucceſſor, Robert Bloet, finiſhed the cathedral, dedicated it to the Virgin Mary, and greatly enriched it. In his time, the biſhopric of Ely was taken out, and made independent of that of Lincoln. The cathedral, having been deſtroyed by fire in 1124, was rebuilt by Alexander de Blois, then biſhop, who arched the new fabric with ſtone, to prevent a recurrence of a ſimilar accident; and greatly increaſed the ſize and augmented the ornaments of it, ſo as to render it the moſt magnificent ſacred edifice in his time.

Biſhop Hugh Burgundus enlarged it by the erection of what is now called the New Work. He alſo built the chapter houſe. This prelate died in 1200. Two kings (John of England and William of Scotland) aſſiſted to carry his body to the cathedral, where it was enſhrined in ſilver, according to Stukeley; but Sanderſon ſays the ſhrine was of beaten gold. Biſhop Gynewell added to the cathedral the chapel of St. Mary Magdalen. Biſhop Fleming built a chapel on the north ſide, in which he was buried: on his monument is his figure in free-ſtone, pontifically habited. Biſhop Alnwick was a conſiderable benefactor to the cathedral, and built the ſtately porch at the great ſouth door. Biſhops Ruſſell and Longland built two chapels: to both theſe prelates are altar-tombs, though the latter was interred at Eton.

The cathedral church conſiſts of a nave, with its aiſles; a tranſept at the weſt end; and two other tranſepts, one near the centre, and the other towards the eaſtern end; alſo, a choir and chancel, with their aiſles, of correſponding height and width with the nave and aiſles. The great tranſept has a nave towards the eaſt: attached to the weſtern ſide of this tranſept is a gallilee, or grand porch; and on the ſouthern ſide of the eaſtern aiſle are two oratories, or private chapels; while the northern ſide has one of nearly ſimilar ſhape and character. Branching from the northern ſide are the cloiſters, which communicate with the chapter-houſe. The church is ornamented with three towers; one at the centre, and two at the weſtern end: theſe are lofty, and are decorated with varied tracery, pillars, pilaſters, windows, &c. The dimenſions of the whole ſtructure, according to the accurate meaſurements of Mr. T. Eſpin of Louth, are as follow: the height of the two weſtern towers 180 feet. Previous to the year 1808, each of theſe was ſurmounted by a central ſpire 101 feet high. The great tower in the centre of the church, from the top of the corner pinnacle to the ground, is 300 feet; its width 53 feet. Exterior length of the church, with its buttreſſes, 524 feet; interior length, 482 feet; width of weſtern front, 174 feet; exterior length of great tranſept, 250 feet; interior, 222; width, 66; the leſſer or eaſtern tranſept 170 feet in length, 44 in width, including the ſide chapels; width of the cathedral, 80 feet; height of the vaulting of the nave, 80 feet. The chapter-houſe is a decagon, and meaſures, interior diameter, 60 feet 6 inches. The cloiſters meaſure 118 feet on the north and ſouth ſides, and 91 on the eaſtern and weſtern ſides. The grand weſtern front, wherein the greateſt variety of ſtyles prevails, is certainly the workmanſhip of three, if not more, diſtinct and diſtant eras. This portion of the fabric conſiſts of a large ſquare-ſhaped façade; the whole of which is decorated with door-ways, windows, arcades, niches, &c. It has a pediment in the centre, and two octangular ſtair-caſe turrets at the extreme angles, ſurmounted by plain ſpire-ſhaped pinnacles. The upper tranſept and the choir appear the next in point of date. Theſe are in the ſharp-pointed ſtyle; and their architecture is very irregular, having pillars with detached ſhafts of Purbeck marble, in different forms, but all very light: thoſe on the ſides of the choir have been ſtrengthened. The vaulting is generally ſimple; the ribs of a few groins only have a filleted moulding. A double row of arches or arcades, one placed before the other, is continued round the inſide of the aiſles, beneath the lower tier of windows. The windows, which are lofty and narrow, are placed two or three together; the greater buttreſſes in front are ornamented in a ſingular manner with detached ſhafts, terminating in rich foliage. This part of the fabric was probably built by biſhop St. Hugh. The great tranſept, the gallilee porch, and the veſtry, are nearly of the ſame, but in a later ſtyle. The veſtry is vaulted, the groining having ſtrong ribs; and beneath it is a crypt with groins, converging into pointed arches. The nave and central tower were next rebuilt, probably begun by biſhop Hugh de Welles, as the ſtyle of their architecture is that of the latter part of the reign of John, or the beginning of Henry III. Part of the great tower was erected by biſhop Groſthead, who finiſhed the additions which had been made to the old weſt front. The part extending from the ſmaller tranſept to the eaſt end appears to have been built by biſhops Graveſend, Sutton, and D'Alderby, about the concluſion of the thirteenth, or commencement of the fourteenth century. The latter prelate built the upper ſtory of the rood tower, and added a lofty ſpire, which was conſtructed of timber, and covered with lead. This was blown down in a violent ſtorm in the year 1547; and the damages then ſuſtained were not wholly repaired till 1775. That nothing might be wanting to render this church as ſplendid in its furniture as it was elegant in its workmanſhip, it received the moſt laviſh donations. So ſumptuouſly was it ſupplied with rich ſhrines, jewels, &c. that, Dugdale informs us, Henry VIII. took away 2621 ounces of gold, and 4285 ounces of ſilver, beſides precious ſtones of great value. This cathedral had formerly a great number of coſtly ſepultures and monumental records: of many, not a veſtige remains; nor are the places known where they ſtood. At the Reformation, what the ravages of time had left, the zealots pulled down or defaced; ſo that, at the cloſe of the year 1548, there was ſcarcely a perfect tomb remaining. Among the illuſtrious perſons who were buried here, and had monuments erected to their memory, were Catherine Swinford, wife of John of Gaunt, duke of Lancaſter; Joan, counteſs of Weſtmoreland, their daughter; and Bartholomew, lord Burgherſh, brother to the biſhop of that name. Many of the biſhops were interred here.

On the north ſide of, and connected with, the cathedral are the cloiſters, of which only three ſides remain in the original ſtate. Attached to the eaſtern ſide is the chapter-houſe, a lofty elegant ſtructure. It forms a decagon, the groined roof of which is ſupported by an umbilical pillar, conſiſting of a circular ſhaft, with ten ſmall fluted columns attached to it; having a band in the centre, with foliated capitals. One of the ten ſides forms the entrance: in the other ſides are nine windows, having pointed arches with two lights each. Over the north ſide of the cloiſters is the library, which contains a large collection of books, and ſome curious ſpecimens of Roman antiquities. It was built by dean Honeywood.

Beſides monaſteries, nunneries, and other edifices for pious uſes, Lincoln had formerly more than fifty churches. Eleven only, excluſive of the cathedral, now remain; and ſcarcely any of them merit a particular deſcription. Thoſe moſt worthy of notice are, St. Bennet's, St. Mary de Wigford's, and St. Peter's at Gowts: theſe have lofty ſquare towers in the Norman ſtyle. St. Peter's is a very ancient ſtructure, and appears to have been the chapel of ſome religious houſe, of which the remains are extant. The places of worſhip for the different denominations of Diſſenters, are, one for Roman Catholics, one for Independent Baptiſts, one for Preſbyterians, and one for Methodiſts.

The number of pariſhes within the city is twelve, which, with the four townſhips within its juriſdiction, make ſixteen. Theſe, according to the government ſurvey in the year 1800, contained 1574 houſes, which were inhabited by 7398 perſons. Many of the houſes are old, but there are ſome very good buildings, both upon and below the hill. The city has of late been conſiderably improved, by making a new road, paving the footways, and erecting a new market place.

Lincoln has an extenſive trade in corn and wool, of which great quantities are exported into Yorkſhire, by veſſels which obtain a back freightage of coals and other neceſſary articles for the uſe of the interior. This city is a county of itſelf, having ſubject to it four townſhips in the vicinity, Bracebridge, Canwick, Branſton, and Waddington, called the "Liberty of Lincoln." This privilege was conferred in the third year of George I.; and in official acts it is denominated, "The City and County of the City of Lincoln." Its viſcountial juriſdiction extends twenty miles round; a privilege unequalled by that of any city in the kingdom. In the 26th year of Edward I. A. D. 1298, Willielmus Diſney and Johannes Marmion were ſummoned to parliament as its firſt repreſentatives. In the hiſtory of the boroughs of Great Britain, it is ſaid, "This city had ſummons, with London and York, to ſend members to parliament, the forty-ninth of Henry III." The right of election is conſidered to be in the freemen, and the number of voters is about eleven hundred. The political influence, though by no means abſolute, is poſſeſſed by lord Delaval, who has a ſeat at Doddington, in the neighbourhood. The civil government of Lincoln is veſted in a corporation, conſiſting of a mayor, twelve aldermen, two ſheriffs, twenty-eight common-councilmen, and four chamberlains; with a recorder, deputy recorder, ſteward of the courts of borough-mote, a town-clerk, four coroners, four ſerjeants of the key, or bailiffs, and other inferior officers. The city was incorporated ſo early as the ſeventh year of Edward II.; Henry Belt being then the firſt mayor. Leland, in his deſcription of Lincoln, enumerates five "Gates in the waulles of the citie," and obſerves, "It is eaſy to be perceived, that the towne of Lincoln hath been notably builded at three tymes."

Of the caſtle, built by the Conqueror, little now remains; and the area is occupied by buildings appropriated to uſes of the municipal power. The few remaining veſtiges convey the ſame idea of original Norman architecture as that of York, erected nearly at the ſame period. The keep was not included, but ſtood half without and half within the caſtle wall, which aſcended up the ſlopes of the hill, and joined the great tower. This being ſituated on a high artificial mount, it was equally inacceſſible from within or without the caſtle area. It was nearly round, and covered the ſummit of the mount. The walls are above ſeven feet in thickneſs. In a corner of the area is a curious ſmall building, appearing on the outſide like a tower, called Cob's-hall; which Mr. King thinks was originally uſed as a chapel.

Few places in the kingdom exhibit ſo many ancient remains as Lincoln. Saxon, Norman, and pointed arches; and door-ways with turrets, walls, mullions of windows, and other fragments of old dilapidated buildings, appear in every direction. Its numerous churches and religious houſes, the veſtiges of which occaſionally meet the eye of the enquiring traveller, are highly intereſting to the antiquary, as tending to illuſtrate the progreſs of the arts, and the hiſtory of paſt ages. The Mint-wall, mentioned by Mr. Gough, is ſtill remaining, and forms part of the incloſure of a garden.

Checquer gate, at the weſt end of the cathedral, had two gate-houſes; the weſtern one has been recently taken down; the remaining one, to the eaſt, has three gateways, and two turrets between them. In Eaſtgate-ſtreet are two very ancient gateways, one of which is nearly entire. At the bottom of the town, near Brayford water, are remains of a fort, called Lucy-tower. In the minſter yard is a large gateway, with grooves for a portcullis. A large oblong building, in Broadgate-ſtreet, was appropriated to the Grey friars, and ſtill diſplays much of its ancient architecture: part of this edifice is now uſed as a free-ſchool, and the other part as a library. The deanery-houſe was founded by dean, afterwards biſhop, Graveſend, in 1254. The vicar's college, called the Old Vicars, formed a quadrangle, of which there remain only four good houſes, inhabited by the vicars. The biſhop's palace, on the ſouth ſide of the hill, which, from being ſituated near the ſummit, Leland deſcribed as "hanging in declivio," was built by biſhop Cheſney, to whom the ſcite was granted by king Henry II. It was enlarged by ſucceeding prelates, and was ſcarcely exceeded in grandeur by any of our ancient caſtles. Adjoining to St. Andrew's church-yard formerly ſtood the palace of the celebrated John of Gaunt. Oppoſite to this houſe is a large building, called John of Gaunt's ſtables. It was a large ſtructure, in the Norman ſtyle, and formerly conſiſted of a quandrangle, encloſing a ſpacious area; of which only the north and weſt fronts remain. The Jew's houſe, on the ſide of the hill, is an object of great curioſity: it is ſingularly ornamented in front, and ſome of its mouldings are ſimilar to thoſe round the weſt doors of the cathedral; in the centre of the front is a ſemicircular arched door-way, with a projecting pilaſter. This houſe was poſſeſſed by Belaſet de Wallingford, a Jeweſs, who was hanged for clipping in the 18th of Edward I. The Stone-bow, a large tower-gateway, croſſing the High-ſtreet, is ſaid to have been erected in the reign of Richard II.; but the ſtyle indicates a later date. The High-bridge, over the main ſtream of the Witham, conſiſting of one arch, is conſidered to be at leaſt five hundred years old. Formerly here were two grammar ſchools, one in the cloſe, the other in the city: they were united in 1583. The principal modern buildings are, the market houſe, erected 1736; the blue-coat-ſchool, on the plan of Chriſt's-hoſpital, London; the county hoſpital; the county gaol, conſtructed on the plan of Mr. Howard for ſolitary confinement; two aſſembly rooms, and a ſmall theatre.

Among the diſtinguiſhed natives of Lincoln was the late Dr. Willis, celebrated for his treatment of inſanity, who died at an advanced age December 1807. Beauties of England, vol. ix. The Hiſtory of Lincoln, 12mo. 1810.

Lincoln, a maritime county of America, in the ſtate of Maine, bounded N. by Kennebeck county, S. by the ocean, E. by Hancock county, and W. by that of Cumberland. The ſea-coaſt extends from that part of Penobſcot bay, oppoſite to Deer iſland eaſtward, to Cape Small-point weſtward. The ſea-coaſt of the counties of Cumberland and Lincoln is 100 miles in extent, meaſured in a ſtraight line, but ſaid to be above 200 by the courſe of the waters. It abounds with ſafe and commodious harbours; and the whole ſhore is covered by a line of iſlands, among which veſſels may generally anchor in ſafety. Acroſs the country there is a water communication by lakes, ponds, and rivers, from the weſtern to the eaſtern bounds; ſo that the productions of the country may be conveyed to the different ſea-ports. The chief towns are Wiſcaſſet, Waldoborough, and Warren.—Alſo, a county of Upper Canada, divided into four ridings and 20 townſhips, containing about 6000 inhabitants, and furniſhing five battalions of militia. It is ſaid that 19 covered waggons brought families to ſettle in the vicinity of the county of Lincoln, in June 1799.—Alſo, a county of Morgan diſtrict, North Carolina, containing 12,568 inhabitants, of whom 1479 are ſlaves. In this county are mineral ſprings and mines of iron. The manufacture of iron is carried on in this county. The chief town is Lincolntown.—Alſo, a county of Georgia, formed in 1796, containing ſeven townſhips, and 4766 inhabitants, including 1433 ſlaves.—Alſo, a county of Kentucky, containing 8555 inhabitants, of whom 1750 were ſlaves. The road from Danville on Kentucky river paſſes through ſouth-weſterly, and over Cumberland mountain to Virginia.—Alſo, a town in Mercer county, Kentucky, on the road from Danville to Virginia; 12 miles S.E. of Danville.—Alſo, a townſhip in Grafton county, New Hampſhire, incorporated in 1764, and containing 41 inhabitants.—Alſo, a townſhip in the N.E. part of Addiſon county, Vermont, containing 97 inhabitants.—Alſo, a townſhip in Middleſex county, Maſſachuſetts, incorporated in 1754, and containing 756 inhabitants; 16 miles N.W. of Boſton.

LINCOLNSHIRE, a maritime county of England, is bounded on the N. by the river Humber, which ſeparates it from Yorkſhire; on the E. by the German ocean; on the S. by Cambridgeſhire and Northamptonſhire; and on the W. by the counties of Rutland, Leiceſter, Nottingham, and York. It is in length 77 miles, and about 48 in breadth; and contained, according to the return made to parliament in 1800, 42,489 houſes, inhabited by 208,557 perſons, *viz.* 102,445 males, and 106,112 females: 24,263 were ſtated to be employed in trade and manufacture; and 60,584 in agriculture. By a return to the houſe of lords in 1805, the area of this county is ſtated to be 2787 ſquare ſtatute miles, equal to 1,783,680 ſtatute acres; the number of inhabitants on each ſquare mile 75; and the total number of perſons 209,025. The total amount of the money raiſed by the poor's rate in 1803 was 145,848*l.* at the rate of 3*s.* 7*d.* in the pound; and the groſs amount of the aſſeſſment under the property tax of 1806 was 2,704,736*l.* The average of the deaths for ten years appears to be as 1 to 49½ of the population. Mr. Stone, in his view of the agriculture of this county, eſtimates the number of acres at 1,893,100; of which he ſuppoſes there may be 473,000 acres of incloſed, marſh, and fen lands, 200,000 of commons, waſtes, and unembanked ſalt marſhes, 268,000 of common fields, 25,000 of woodlands, and 927,120 of incloſed upland. Mr. Arthur Young ſtates the area of this county at 2888 ſquare miles, or 1,848,320 acres; of which he ſays, the wolds contain, 234,880; the heath 118,400; lowland 776,960; and miſcellaneous ſoils 718,080.

That part of Britain which is now called Lincolnſhire, was, anterior to the Roman conqueſt, poſſeſſed by a claſs of Britons known by the name of Coritani. During the Roman dominion, this diſtrict was included within the province of Britannia prima; and was interſected by different roads, occupied by military ſtations, and ſome of its natural inconveniences removed by Roman ſcience and induſtry. The principal roads were the Britiſh Ermin-ſtreet, afterwards adopted by the Romans, and the Foſs-way. A great work of this county, generally attributed to the Romans, is the Car-dyke, a large canal or drain, which extends from the river Welland, on the ſouthern ſide of the county, to the river Witham, near Lincoln. Its channel, for nearly the whole of this courſe, an extent of upwards of forty miles, is ſixty feet in width, and has a broad flat bank on each ſide. This great canal receives from the hills all the draining and flowing waters, which take an eaſterly courſe, and which, but for this Catchwater drain, as it is now appropriately called, would ſerve to inundate the Fens. Several Roman coins have been found on the banks of this dyke. The whole of the preſent county is ſuppoſed to have been named by the Romans Lindum, and the principal ſtation or town Lindum colonia.

During the Anglo-Saxon dominion in England, Lincolnſhire was incorporated within the kingdom of Mercia, which, according to an old chronicle quoted by Leland, was then divided into two provinces, north and ſouth; and as the Trent was the line of ſeparation, the county of Lincoln conſtituted a conſiderable part of South Mercia. Crida was the firſt Mercian ſovereign, and began his reign in 586. At this time Mr. Turner, (Hiſtory of the Anglo-Saxons,) ſuppoſed that the whole iſland was governed by eight Anglo-Saxon monarchs; whence it ſhould rather be denominated an octarchy then an heptarchy. During the eſtabliſhment of theſe petty kingdoms, the Saxons were in conſtant warfare with the Romanized Britons; and after theſe were ſubdued, the former were repeatedly embroiled in conflicts with each other. In the midſt of theſe civil commotions Chriſtianity was introduced, and gradually made its progreſs through the iſland; giving a new turn to human purſuits, and diverting and engroſſing the attention of the barbarous heathens. Peada, the ſon of Penda, was the reigning monarch here, when this religion was accepted by the South Mercians: he founded a monaſtery at Meden-hamſted, now Peterborough. He was ſoon afterwards murdered, as ſuppoſed, by his wife. Edwin the Great, the firſt Chriſtian king of Northumberland, conquered the counties of Durham, Cheſter, Lancaſter, the Iſle of Man, and Angleſea, carried his arms ſouthward over the Trent, and obtained all the province of Lindſey. Paulinus, who converted him to Chriſtianity, preached the goſpel wherever that king's power extended. He built the cathedral of Southwell, a little weſt of Newark, baptized many thouſands in the river Trent, near to Tiovulfingaceſter, and converted Blecca, the governor of Lincoln. This was about the year 630. The learned and pious Alkfrid kept his court at Stamford in 658. After the death of Oſwy, king of Northumberland, Egfrid, his ſon, invaded Wulfere, and wreſted from him the whole province of Lindſey in Lincolnſhire. In 677 he erected the epiſcopal ſee of Sidnaceſter, in favour of Eadhed, who had been chaplain to his brother Alkfrid, king of Deira. In 683, Eadhed removed to Ripon, where he remained till his death. The ſouth Mercian kingdom and biſhop's ſee being thus eſtabliſhed, but few public events are recorded, till the incurſion of the Danes, who, in the year 870, laid waſte great part of Lincolnſhire, and burned the monaſteries of Bardney, Croyland, and Medenhamſted, putting all the monks to the ſword. After the defeat of the Danes by Alfred, the ſovereignty of Mercia fell into his power. He did not, however, avowedly incorporate it with Weſſex, but diſcontinued its regal honours; and during the reign of Edward the Elder, it was found neceſſary to conſtruct and fortify ſeveral places on the borders of Mercia joining Northumbria, particularly on the banks of the Humber. Mercia was ſoon afterwards annexed to Weſſex, but ſome places were ſtill held by the Danes; among theſe were the towns of Stamford and Lincoln, even ſo late as 941, when Edmund the Elder expelled them hence.

The maritime counties of England being more directly expoſed to attack from invading armies and piratical plunderers; and in the early part of our civil eſtabliſhments, being more populous than the midland country, were therefore frequently expoſed to the conflicts of warfare; and hence it is found that theſe diſtricts abounded with military works and caſtles or caſtellated manſions. Beſides the permanent ſtations of the Romans in Lincolnſhire, they threw up caſtrametations in different places; to guard the vallies, protect the great roads, and defend the mouths of the rivers. In the continued wars between the Anglo-Saxon kingdoms, theſe were again occupied by the contending parties; and after the Norman conqueſt, ſome of the moſt commanding were adopted by the conqueror's captains and barons, and then became heads of extenſive lordſhips. To deſcribe or diſcriminate them, is, and ever will be, impoſſible; for documents are wanting, and the innovations of the latter occupiers generally obſcured or annihilated all traces of their predeceſſors. Excluſive of the Roman ſtations, there are notices or remains of the following fortifications in this county. Encampments at or near Brockleſby, Hibberſton, Broughton, Roxby, Winterton cliffs, Aulkborough, Yarborough, South Ormſby, Burwell, Stamford, Caſtle-hill near Gainſborough, Winterington, Humington, Ingoldſby, Caſtle Carleton, Burgh, Brough, north of Caſton, Barrow. Caſtles, or remains at Horncaſtle, Tatterſhall, a noble remain, Bourne, only earth-works remaining, Caſtor, Somerton, Moor Tower, Stamford, Scrivelſby, Torkſey, a fine remain, Sleaford, only earth-works, Bollingbrook, Lincoln, with walls and gates, Folkingham, with large foſſæ, Kyme tower, and Huſſey tower, near Boſton, Pinchbeck, a moated manſion, Bitham.

According to the beſt authorities, the epiſcopal ſee was eſtabliſhed at Lincoln towards the cloſe of the eleventh century, previous to which era, the dioceſe had conſiſted of the two Anglo-Saxon ſees of Dorcheſter, now a village in Oxfordſhire, and Sidnaceſter a place bordering on the river Trent. The dioceſe of Lincoln is the largeſt in the whole kingdom, notwithſtanding thoſe of Oxford, Peterborough, and Ely, have been taken from it. It comprehends the counties of Lincoln, Leiceſter, Huntingdon, Bedford, and Buckingham, excepting the pariſhes of Monks, Riſborough, and Halton, which are peculiars of Canterbury; and Abbot's, Aſton, and Winſlow, (which, with fifteen other pariſhes that are in Hertfordſhire, and were taken hence, being made of exempt juriſdiction, and appropriated to the abbey of St. Albans, became, on the diſſolution of that monaſtery in 1541, part of the dioceſe of London.) The ſee alſo retains the greater part of Hertfordſhire, and ſeveral pariſhes in the counties of Oxford, Rutland, and Northampton. The whole dioceſe is divided into ſix archdeaconries; theſe are ſubdivided into fifty-two deaneries; the number of pariſhes is ſtated by Browne Willis to be, including donatives and chapels, 1517, of which 577 are impropriated; and the clergy's yearly tenths in this very extenſive juriſdiction 1751*l.* 14*s.* 6*d.* Camden ſays there are 630 pariſhes in this county. The monaſteries, hoſpitals, &c. connected with the cathedral and its eccleſiaſtical eſtabliſhment, were very numerous, and ſome of very extenſive influence.

The eccleſiaſtical architecture of Lincolnſhire has long been juſtly celebrated for its magnificence; and its numerous churches have been the ſubjects of admiration. It is remarkable that the moſt ſplendid edifices which adorn this diſtrict, were erected chiefly in its loweſt and moſt fenny ſituations, where all communication muſt formerly have been, and even to this day is extremely difficult. The eccleſiaſtical edifices in the diviſion of Lindſey, excepting the cathedral of Lincoln, are in general inferior to thoſe in Keſteven and Holland; but in the north-eaſtern part of this diviſion, which is bounded by the German ocean to the eaſt, and the highlands, called the Wolds, to the weſt, there are ſeveral churches, diſplaying much elegance in their architecture, and built of excellent materials. The diviſion of Keſteven abounds with churches ſplendid both in their plans and decorations. In the central part, the greater proportion of them is adorned with lofty ſpires; while many of thoſe in the northern and ſouthern extremities preſent handſome towers, frequently divided into three or four diſtinct ſtories, and formed of excellent materials and maſonry. The date of the churches in this diviſion, with the exception of thoſe of Sempringham and St. Leonard Stamford, is, in few inſtances, earlier than the thirteenth century. It is principally in the diviſion of Holland that Lincolnſhire boaſts of ſuperior excellence in eccleſiaſtical architecture; and it is really ſurpriſing that ſo many fine monaſtic buildings, and ſacred edifices, ſhould have been erected in a county ſo inconvenient for travelling, ſo unpleaſant to the eye, and ſo uncongenial with the common comforts of life; yet in this fenny and ſwampy diſtrict, are the churches of Boſton, Goſberton, Pinchbeck, Spalding, Holbeach, Gedney, Long-Sutton, Croyland, and many others, which have a juſt claim to univerſal admiration. The character and plan of the churches in this diviſion vary in different parts. Some are cruciform; many have ſpires in common with thoſe of Keſteven; while embattled towers at the weſt end form the principal feature of the remainder. Of the ſplendid church at Croyland, only a ſmall portion of the original ſtructure now remains; but ſufficient to ſhew that in its entire ſtate, it was not inferior to any of our cathedrals, either in ſize or architectural ornament. The ſtone employed in the erection of the edifices of this diſtrict is univerſally found to be of an excellent and durable ſpecies, ſtill retaining at the diſtance, in many inſtances, of ſix or ſeven centuries, its original face and firmneſs.

This county is more noted for its religious than for its civil architecture. Though of great extent, it contains but few manſions of conſequence, grandeur, or elegance, and thoſe are chiefly of modern erection. The following are the principal; Grimſthorpe caſtle; the ſeat of the duke of Ancaſter-Nocton; earl of Buckinghamſhire—Glentworth; earl of Scarborough—Brokleſby; lord Yarborough—Belton; lord Brownlow—Redbourn; lord William Beauclerk—Burton; lord Monſon—Doddington; lord Delaval—Bloxholm; Hon. colonel Manners—Manby; Hon. Charles Anderſon Pelham—Reveſby abbey; ſir Joſeph Banks, bart.

Lincolnſhire, and the counties of Eſſex, Cambridge, and Norfolk, have been generally deſcribed as particularly unfavourable to health; and from their contiguity to the ſea, with the numerous fens, meres, brooks, &c. with which they abound, are commonly ſtigmatized as producing peſtilential climates, only calculated to excite agues, cramps, and rheumatiſms. Theſe general maxims, though frequently originating in facts, are too often perverted, or extended beyond due bounds. Lincolnſhire may be ſaid to be in this predicament; for its name is commonly aſſociated with fens, flatneſs and bogs. Thoſe who reſide in, or have travelled over it, are enabled to appreciate and define its character. Arthur Young has pointed out and deſcribed many features and places in this county, that may be referred to as partaking of the beautiful and pictureſque:—"About Belton," he ſays, "are fine views from the tower on Belmont; Lynn and the Norfolk cliffs are viſible, Nottingham caſtle alſo, the vale of Belvoir, &c. And in going by the Cliff towns to Lincoln, there are many fine views. From Fullbeck to Leadenham, eſpecially at the latter place, there is a moſt rich proſpect over the vale of the Trent to the diſtant lands that bound it. Theſe views, over an extenſive vale, are ſtriking, and of the ſame features as thoſe from the cliff-road to the north of Lincoln, to Kirton, where is a great view both eaſt and weſt to the Wolds, and alſo to Nottinghamſhire. Near Gainſborough there are very agreeable ſcenes; from the plantation of H. Dalton, of Knaith, and from the chateau battery of Mr. Hutton, of Burton, the view of the windings of the Trent, and the rich level plain of meadow, all alive with great herds of cattle, bounded by diſtant hills of cultivation, are features of an agreeable county. But ſtill more beautiful is that about Trentfall; from ſir John Sheffield's hanging wood, and the Rev. Mr. Sheffield's ornamented walk, following the cliff to Alkborough, where Mr. Goulton's beautiful grounds command a great view of the three rivers; as the ſoil is dry, the woods lofty, and the county various, this muſt be eſteemed a noble ſcenery, and a perfect contraſt to what Lincolnſhire is often repreſented by thoſe who have only ſeen the parts of it that are very different. The whole line of the Humber hence to Grimſby, when viewed from the higher wolds, preſents an object that muſt be intereſting to all. This, with the very great plantation of lord Yarborough, are ſeen to much advantage, from that moſt beautiful building, the mauſoleum at Brocklesby." Many other parts of the county might be pointed out as preſenting in themſelves, or commanding, intereſting ſcenery. The country around Grantham, alſo in the vicinity of Louth, and that more particularly between Bourn and the former place, including the noble and ſpacious woods of Grimſthorpe, abound with that inequality of ſurface, that diverſified interchange of hill and dale, wood and lawn, which conſtitute the pictureſque and beautiful in natural ſcenery.

Lincolnſhire may be ſaid to preſent three great natural features, each of which has a ſpecific and nearly uniform character. Theſe are the wolds, heaths, and fens. The latter occupy the ſouth-eaſtern ſide of the county, and though formerly a mere waſte and perfectly ſterile, have been, by means of drainage, &c. rendered ſubſervient to agriculture; many parts indeed may be pronounced uncommonly fertile. On the ſea coaſt, towards the north part of the county, this tract is narrow; near the Humber it contracts to a mere ſtrip of land. The heaths, north and ſouth of Lincoln, and the wolds, are calcareous hills, which, from their brows, command many fine views over the lower regions. The reſt of the county is not equally diſcriminated, either by fertility or elevation. "The heath, now nearly incloſed," ſays Arthur Young, "is a tract of high country, a ſort of back bone to the whole, in which the ſoil is a good ſandy loam, but with clay enough in it to be ſlippery with wet, and tenacious under bad management; but excellent turnip and barley land, on a bed of lime-ſtones, at various depths, from ſix inches to ſeveral feet, commonly nine inches to eighteen. This hill ſlopes ſharply to the weſt; the declivity of the ſame nature, but generally good; and this extends ſome diſtance in the flat vale, for the firſt line of villages, (built alſo as the ſoil lies in a longitudinal direction north and ſouth.) The ſoil is rich loam, containing much paſturage." Between Gainſborough and Newark, for twenty-five miles, is a large tract of flat ſandy ſoil, the greater part of which has been incloſed, and partly drained. The ſoil of the iſle of Acholme may be ſaid to be among the fineſt in England. It conſiſts of black ſandy loams, warp land, brown ſand, and rich loams of a ſoapy and tenacious quality. The under ſtratum at Stacey, Belton, &c. is, in many places, an imperfect plaſter ſtone. Reſpecting the general products of the county, the higher grounds are now moſtly incloſed, and appropriated to tillage, and produce all ſorts of grain. Some of the wolds, however, are not yet divided, but are devoted to ſheep and rabbits. The lower lands that have been drained and incloſed, produce abundant crops of oats, hemp, flax, &c.

Lincolnſhire has long been famous for a breed of fine horſes; but the adjoining county of York has now the credit for rearing many that are actually bred in this county. In ſome diſtricts great numbers of mares are kept for the ſole purpoſe of breeding. In Holland Diviſion almoſt every farmer keeps ſome; and the number of colts reared is very great. The neat cattle of this county are deſcribed by Mr. Stone as being, for the greateſt part, of a large ſort, having great heads and ſhort horns; ſtout in the bone, and deep in the belly; with ſhort necks and fleſhy quarters, narrow hips and chines, high in their rumps, and bare on the ſhoulders. The cows, he remarks, when fat, weigh from eight to nine hundred, and the oxen from ten to twelve hundred. The moſt profitable ſtock of the county appears to be ſheep. Numbers are bred and fattened in this part of the kingdom. Large quantities of wool are thence obtained, to ſupply the demands of the neighbouring diſtricts. It is a curious fact, that while ſo much has been ſaid in commendation of the Leiceſterſhire breed, the Lincolnſhire, which is the ſame, ſhould have been paſſed over in ſilence. Mr. Stone ſays, theſe ſheep are not even varieties. The Lincolnſhire, a large horned animal, adapted for the rich grazing and marſh land of the county; generally weighs well when fat, and bears a heavy fleece of coarſe but long ſtapled wool; the weight, per fleece, is eight pounds and upwards. Mr. Young mentions a ſheep ſold at Smithfield, which clipped, the firſt year, 23lb. of wool, and in the ſecond year, 22½lb. Few manufactures are eſtabliſhed in this county; but here are two objects of conſiderable merchandize, rabbits' fur, and gooſe feathers. Theſe were formerly of great conſequence, and furniſhed articles of extenſive trade. From the ſyſtem of incloſing, now ſo extenſively adopted, both rabbits and geeſe are much diminiſhed.

The rabbit warrens of this county were formerly much more extenſive than at preſent. and were preſerved on a principle of improvement; ſome being broken up for tillage, and others, which had been under tilth, being again laid down for this purpoſe. The ſoil of old warrens, by the rabbits continually ſtirring and ventilating the earth in burrowing, has been found incomparably better than lands of a like nature left in their original ſtate. The fecundity of rabbits was a circumſtance of no ſmall conſequence, when the ſkins of large well-choſen rabbits would produce *2s. 6d.* or *3s.* each: at that time they were uſed in making muffs, tippets, lining robes, &c.: the down was alſo employed in hats. As the ſkins conſtitute the principal profit of the proprietor, it becomes a primary object with him to attend to the breeding, killing, &c.: ſkins that are free from black ſpots on the inſide are ſaid to be in ſeaſon. The trade is now on the decline, not only from the diminution in the value of the ſkins, but alſo from the means of conducting it becoming daily more circumſcribed, it being now thought good huſbandry to deſtroy the warrens, and apply the land to other uſes. The number of warrens in this county has been greatly reduced, yet many thouſand acres are ſtill devoted to this kind of ſtock.

Many of what are called the fens, are in a ſtate of waſte, and ſerve for little other purpoſe than breeding and rearing geeſe, which are conſidered the fenman's treaſure. They are a highly valuable ſtock, aud live where, in the preſent ſtate of thoſe lands, nothing elſe will: they are very prolific, and the young quickly become ſaleable, or ſpeedily contribute to increaſe the ſtock. The feathers are very valuable; and however trifling it may appear, the ſale of quills alone amount, on a large flock, to a conſiderable ſum. "During the breeding ſeaſon," Mr. Gough ſays, "theſe birds are lodged in the ſame houſes with the inhabitants, and even their very bed-chambers; in every apartment are three rows of coarſe wicker pens, placed one above another; each bird has its ſeparate lodge, divided from the other, which it keeps poſſeſſion of during the time of ſitting. A gozzard, or gooſeherd, attends the flock, and twice a day drives the whole to water, then brings them back to their habitation, helping thoſe that live in the upper ſtories to their neſts, without ever miſplacing a ſingle bird." The geeſe are uſually plucked five times in the year: at Lady-day for quills and feathers, and again at Midſummer, Lammas, Michaelmas, and Martinmas. Goſlings are not ſpared, as early plucking tends to increaſe the ſucceeding feathers. Mr. Young ſtates, that "the feathers of a dead gooſe are worth ſixpence, three giving a pound; but plucking alive does not yield more than three-pence a head *per annum*. Some wing them only once every quarter, taking ten feathers from each gooſe, which ſell at five ſhillings a thouſand. Plucked geeſe pay, in feathers, one ſhilling a head in Wildmore Fen." The common mode of plucking live geeſe is conſidered a barbarous cuſtom; but it has, perhaps, prevailed ever ſince feather beds came into general uſe. The mere plucking is ſaid to hurt the bird but little, as the owners are careful not to pull before the feathers are ripe, that is, juſt ready to fall: if forced from the ſkin ſooner they are of inferior value.

The general improvements that have been effected in this county within the laſt twenty years, and that are now gradually making, have co-operated to alter the general appearance, the agriculture, climate, &c. ſo materially, that the ſurface has aſſumed a new aſpect, the value of land is greatly increaſed, the means of ſocial and commercial communication have been facilitated, and the comforts of domeſtic life greatly promoted. Yet there is ſtill ſcope for material improvements: for the roads, in many parts of the county, are in a very bad ſtate; and the traveller has not advantages adequate to the tolls levied on him. In the vicinity of Boſton, Spalding, and Louth, the commiſſioners have commenced a plan for forming firm and ſubſtantial roads. This is moſtly done by laying ſhingles, brought from the Norfolk coaſt, in the centre of the road, and mixing them with the ſilt of the place.

The wolds extend from Spilſby, in a north-weſterly direction, for about 40 miles to Barton, near the Humber. They are, on an average, nearly eight miles in breadth, of ſand and ſandy loam, upon flinty loam, with a ſubſtratum of chalk. Beneath this line lies an extenſive tract of land at the foot of the wolds, called the marſh, which is ſecured from the encroachments of the ſea by embankments, and is agriculturally divided into north and ſouth marſhes by a difference in the ſoil.

The fens of this county form one of its moſt prominent features. They conſiſt of lands which, at ſome diſtant period, have been inundated by the ſea, and by human art have been recovered from it. In the ſummer they exhibit immenſe tracts, chiefly of grazing land, interſected by deep ditches, called droves, which ſerve both for fences and drains. Theſe are accompanied generally by parallel banks, upon which the roads paſs, and are intended to keep the waters, in flood time, from overflowing the adjacent lands. They not only communicate with each other, but alſo with larger canals, called dykes and drains, which, in ſome inſtances, are navigable for boats and barges. At the lower end of theſe are ſluices, guarded by gates, termed gowts. During the ſummer, numerous flocks and herds are ſeen grazing over this monotonous ſcene, and many of the paſtures afford a luxuriant herbage: but in the winter, or in the autumn, if it ſhould prove wet, the aſpect is changed; the cattle quickly diſappear, and the eye muſt paſs over thouſands of acres of water or ice, before it can find an object on which to reſt. Several cauſes combine to produce this drowning of the lands. Many of the fens lie below the level of the ſea; ſome are lower than the beds of the rivers; and all are beneath the high-water mark of their reſpective drains. The ſubſtratum of the fens is ſilt, or ſea-ſand, which is a well-known conductor of water. Through this, when the drains are full, the ſea-water filters; and, unable to paſs by the drains, riſes on the ſurface, and is known by the name of ſoak. Dugdale was of opinion, that there was a time when theſe parts were not inundated. In his hiſtory of embanking, he obſerves, that the iſle of Axholme, though for many ages it hath been a fenny tract, was not anciently ſo, but was originally a *woody* country, not annoyed with theſe inundations, as is evident from the great numbers of trees which had been found in the moor. The ſame author, ſpeaking of the great level, gives his opinion that it was formerly firm and dry land, neither annoyed with ſtagnation of freſh waters, nor inundations from the ſea; and this he ſuppoſes was the caſe of the fens in Lincolnſhire, and the adjoining counties: for it is an eſtabliſhed fact, that large timber trees will not thrive in watery lands, and ſuch have been found lying in the earth abundantly in this country.

The principal rivers which either riſe in the county, paſs through it, or are connected with it, are the Trent, the Ancholme, the Witham, the Welland, and the Glen. The Trent, though not properly a river of this county, forms the boundary of it on the north-weſtern ſide, from the village of North Clifford to that of Stockworth; whence it conſtitutes the eaſtern boundary of the iſle of Axholme: it thence flows to Aldborough, and having received the Dun and the Ouſe, mingles its waters with the Humber. From Gainſborough, where it is croſſed by a handſome bridge, it is navigable for coals, corn, and various articles of commerce. The Ancholme is a ſmall river, riſing in the wolds, near Market-Raiſin, whence it is navigable to the Humber, into which it falls ſome miles below the junction of the Trent. The Welland has its ſource near Sibertoff, in Northamptonſhire; and being increaſed by numerous ſtreams, paſſes Market-Deeping; where, entering the fens, it leaves a portion of its waters and ſludge, which it had accumulated in its previous paſſage through the rich lands of Northamptonſhire, Leiceſterſhire, and Rutlandſhire. It afterwards meets the contributory Glen, and empties itſelf into Foſsdyke-Waſh, eaſt of Boſton. The Witham, which is completely a river of this county, derives its origin near South-Witham; and thence flows almoſt due north, through the park of Eaſton, and to Great Ponton. It proceeds through a wide valley to Lincoln: continuing its courſe to Boſton, it unites its waters with the ſea at a place called Boſton-Deeps. Much of the preſent bed of the river, from Boſton upwards, is a new cut, made for the purpoſe of widening the channel, rendering it more commodious for navigation, and better adapted to receive and carry off the water of the contiguous fens. Theſe rivers, with thoſe of the Grant, Ouſe, and Nene, in the adjacent counties, from the obſtructions they meet in delivering their waters to the ocean, form one great cauſe of inundating ſo large a portion of valuable land. In viewing the various inlets of the ſea, it is ſurpriſing to obſerve the immenſe quantity of ſand and ſludge which is continually depoſiting on the ſhore. This is owing to the nature of the tides, which, from the form of the channel, flow with more violence than they ebb. Hence the mouths of the rivers are choaked up, and the deſcending waters are thrown back on the low-lands. The great bay, or eſtuary, into which the different rivers, paſſing through the fens, are emptied, is very ſhallow, and full of ſhifting ſands and ſilt.

That this diſtrict was thus flooded at a very remote period, is evident from the plans of embanking and draining which the Romans adopted, in order to counteract the miſchievous effects of ſuch inundations. Since their departure, much has been done at various times for the improvement of the fen country; and an immenſe expence has been occaſionally, and is ſtill annually, incurred, to prevent the encroachment of the water, and to ameliorate the ſoil. A very brief notice of theſe endeavours will tend to give ſome idea of the country, and to illuſtrate thoſe periods of hiſtory. Deeping-Fen, on the banks of the Welland, appears to have received the earlieſt attention: for, at the beginning of Edward the Confeſſor's reign, (as Ingulphus relates,) a road was made acroſs it by Egelric, formerly a monk of Peterborough, but at that time biſhop of Durham. In the time of the Conqueror, Richard de Rulos, the king's chamberlain, incloſed this part of the fen-country from the chapel of St. Guthlake to Cardyke, and to Clevelake near Cranmore; excluding the river Welland by a large and extenſive bank of earth. The Foſs-Dyke is an artificial trench, extending about ſeven miles in length, from the great marſh near the city of Lincoln to the river Trent in the vicinity of Torkſey. This was made or materially altered by king Henry I. in the year 1121, for the purpoſe of navigation, and for making a general drain for the adjacent level. From its paſſing through ſuch a flat country, the water could have but a ſlow current, whereby it became unnavigable from the accumulation of mud, ſo that it was ſoon found neceſſary to cleanſe it. Of the marſhes on the river Ancholme, the firſt account on record is the 16th of Edward I. In ſucceeding reigns, various ſtatutes were enacted for rendering effectual the drainage of this part of the country. The iſland of Axholme, though now containing ſome of the richeſt land in the kingdom, was formerly one continued fen, occaſioned by the ſilt thrown up the Trent with the tides of the Humber. This obſtructing the free paſſage of the Dun and the Idle, forced back their waters over the circumjacent lands, ſo that the higher central parts formed an iſland, which appellation they ſtill retain. In the firſt of Edward III., and in ſeveral ſucceeding reigns, commiſſions were granted for repairing the banks and ditches, as they fell to decay. Early in Charles I.'s reign, that great work was commenced, which embraced not only the marſhes of Axholme, but of all the adjacent fens, called Dikeſmarſh and Hatfield chaſe, in the county of York. Theſe comprehended an extent of lands which were not only drowned in winter, but even in ſummer were ſo deeply covered with water, that boats could navigate over 60,000 acres. It is traditionally affirmed that large veſſels could ſail up the river Witham from Boſton to Lincoln; and from the ribs, timbers, &c. of ſhips, that have been frequently found near it, the tradition ſeems to be juſtified. At preſent, it is only adapted for barges, and the flow of the current is ſo ſmall, that it does not cleanſe the bed of the river. The firſt notice of the inconveniences ariſing from the obſtruction of its waters, appears in the ſixth year of Edward III., when commiſſioners were appointed for ſurveying the ſame. In conſequence of their report, and of various ſurveys and preſentments in different reigns, ſucceſſive regulations were made for reſtraining the waters within due bounds, and delivering the land-floods ſpeedily to the ſea. But in the fifteenth of Henry VII., more effectual meaſures were thought neceſſary to be adopted for furthering the deſign; and an able engineer, Mayhave Hake, of Graveling in Flanders, was invited over to put it into execution. It was accordingly covenanted between him and the king's commiſſioners, "that the ſaid Mayhave Hake ſhould bring with him from Flanders fourteen maſons, and four labourers, to make him a proper ſluice and dam near the town of Boſton, ſufficient for its future ſafeguard. For which they were to be remunerated as follows: Mayhave Hake, for himſelf and man, per diem 4*s.*; maſons and ſtone-hewers, per week, 5*s.*; labourers, per week, 4*s.* The ſaid Mayhave Hake to receive 50*l.* more on the completion of the work.—Should any more workmen be neceſſary they ſhould be provided at the expence of the inhabitants of Boſton, and the level of Holland and Keſteven." To the north and north-eaſt of the Witham, are the large fenny tracts called Wildmore Fen, Weſt Fen, and Eaſt Fen, in the latter of which, it appears by a writ, 41 Elizabeth, 5000 acres were drowned. A plan is now executing under the direction of that very ſcientific and able engineer Mr. John Rennie, by which theſe three fens will be effectually drained, and the lowlands of this part of the county be rendered productive and profitable.

Lincolnſhire conſiſts of three great diviſions; Holland, Keſteven, and Lindſey; which are ſubdivided into 32 hundreds, wapentakes, and ſokes; containing in the whole one city, 31 market-towns, 657 villages. Twelve members are returned to parliament; two for the ſhire, two for the city, and two from each of the boroughs of Boſton, Grantham, Great Grimſby, and Stamford. Spalding and Waynfleet were repreſented in the eleventh year of Edward III. This county, from its extent and opulence, is not under the influence of any individual; and in conteſted elections the freedom of the people is not ſo liable to corruption as in ſmaller counties and property boroughs. Beauties of England and Wales, vol. ix. Stone's Agricultural Survey of Lincolnſhire. Young's Ditto.

LINCOLNTOWN, a poſt-town of America, in North Carolina, and capital of Lincoln county, containing about 35 or 40 houſes, a court-houſe, gaol, and church; 46 miles from Morgantown.

LINCOLNVILLE, a town of Hancock county, in the ſtate of Maine, on the W. ſide of Penobſcot bay; 12 miles from Belfaſt.

LINCONIA, in *Botany*, a name given by Linnæus, but of whoſe origin or derivation we are unable to trace any thing.—Linn. Mant. 147. Schreb. 170. Willd. Sp. Pl. v. 1. 1296. Juſſ. 442.—Claſs and order, *Pentandria Digynia.* Nat. Ord. *Incertæ ſedis*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of four ovate, permanent leaves, the inferior oppoſite pair ſhorter. *Cor.* Petals five, lanceolate, ſeſſile, erect. Nectary a cavity impreſſed at the baſe of the petals, ſurrounded below by a margin. *Stam.* Filaments five, awl-ſhaped, bordered, erect, of middling length; anthers obtuſe, arrow-ſhaped, burſting towards the baſe of each lobe. *Piſt.* Germen half inferior with reſpect to the corolla, but ſuperior with reſpect to the calyx; ſtyles two, thread-ſhaped, ſtriated; ſtigmas ſimple. *Peric.* Capſule of two cells. *Seeds* two?

Linnæus obſerves that if the perianth may be taken for bracteas, the flower is altogether ſuperior, but this does not ſeem correct.

Eſſ. Ch. Petals five, having each a honey-bearing cavity at their baſe. Capſule of two cells, half inferior.

1. L. *alopecuroidea.* Linn. Mant. 216. Syſt. Veg. ed. 14. 261.—A native of mountainous watery places at the Cape of Good Hope. This is a *ſhrub* furniſhed with wand-like determinate *branches*, ſcarred with the baſes of the fallen leaves, as in the fir tribe. *Leaves* ſcattered, or ſomewhat whorled, about five or ſix in a whorl, almoſt ſeſſile, linear, triangular, channelled, rigid, ſhining, appearing curiouſly granulated under a microſcope, an inch long, rough at the angles, the upper ones fringed. *Flowers* about the tops of the branches, lateral, ſeſſile, the length of the leaves, permanent, fleſh-coloured, or white.

LINCTUS, a form of medicine, the ſame as *lambative*, *lohoch*, and *eclegma*.

LINDA, in *Geography*, a ſmall iſland in the Indian ſea, near the coaſt of Africa, at the mouth of the Zambeſe.

LINDAHL, a town of Norway; 140 miles N. of Chriſtiania.

LINDANUS, William, in *Biography*, a celebrated Dutch divine, was born at Dort, in Holland, in the year 1525. He purſued his academical ſtudies at Louvain, and afterwards went to France to perfect himſelf in the Greek and Hebrew languages. Having returned to Louvain, he was ordained a prieſt, and admitted a licentiate in divinity. This was in the year 1552, and in the following year he undertook the office of lecturer on the ſacred ſcriptures at Dillingen, which poſt he filled for three years with high reputation. He took his degree of D.D. in 1556, after which he was appointed dean of the Hague; counſellor to the king; vicar to the biſhop of Utrecht, and inquiſitor of the faith within the ſame eccleſiaſtical juriſdiction. On account of his great zeal in the latter office, the duties of which he performed with much ſeverity, he was nominated, by the bigotted Philip II. of Spain, to the biſhopric of Ruremond. In 1568 he went to Rome, and was received by pope Gregory XIII. and the cardinals with ſingular marks of reſpect and eſteem. On his return he exerciſed the functions of a Chriſtian biſhop in a very honourable manner, applying the revenues of his ſee to the relief of the indigent, and viſiting every part of his dioceſe for the purpoſe of perſonally comforting, inſtructing, and aſſiſting thoſe who ſtood in need of temporal or ſpiritual aid. After a ſecond journey to Rome, he was appointed, in 1588, to the biſhopric of Ghent, an office which he held but three months, when he died in the ſixty-third year of his age. He was reckoned a very learned man and an able divine. His writings are numerous, conſiſting of Polemical treatiſes; Paraphraſes on many of the Pſalms, and the Pſalter, illuſtrated with Greek and Hebrew texts: but his moſt valued publication is entitled "Panoplia Evangelica." Moreri.

LINDAR, in *Geography*, a town of Iſtria; 5 miles N.E. of Mittenburg.

LINDAU, an imperial city of Germany, ſeated on an iſland in the lake of Conſtance, and communicating with the continent by means of a bridge. The iſland is ſo divided by an arm of the lake, as to form another ſmaller iſland, which is ſeparated from the city, and conſiſts of vineyards and garden encloſed within a wall. Lindau, from its peculiar ſituation, has been called the Venice of Swabia. Moſt of the burghers are Lutherans. This city contains, beſides a pariſh church dedicated to St. Stephen, a well-endowed hoſpital, and a grammar-ſchool. The caſtle, and Heyden Maur, or Heathen wall, as it is called, are reckoned Roman works; the latter being aſcribed to Tiberius Nero, and the former to Conſtantinus Chlorus, during their encampments here, in their expeditions againſt the Vindelici and Alemanni. It is ſuppoſed that near this caſtle formerly ſtood a church, and that the little church of St. Peter here was built on the firſt introduction of Chriſtianity into this country. The territory of Lindau comprehends 14 villages; 19 miles E. of Conſtance. N. lat. 47° 28′. E. long. 10° 35′.—Alſo, a town and caſtle of Hungary; 17 miles N.N.W. of Cſakathurn.—Alſo, a town of Weſtphalia, in the territory of Eichfeld, ſituated on the Rhine; 12 miles N.W. of Duderſtadt.—Alſo, a town of Germany, in the principality of Anhalt Zerbſt; 5 miles N. of Zerbſt.—Alſo, a town of Germany, in the principality of Bayreuth; 8 miles N.W. of Bayreuth.

LINDE, or Lindesberg, a town of Sweden, in Weſtmanland, ſituated between two lakes; built by queen Chriſtina in 1644; near it is a medicinal ſpring; 85 miles W.N.W. of Stockholm. N. lat. 59° 35′. E. long. 14° 56′.

LINDEAL, a town of Hindooſtan, in the circar of Cuddapa; 25 miles N. of Gandicotta.

LINDECK, a town of the duchy of Stiria; 8 miles N. of Cilley.

LINDEN, a town of Germany, in the principality of Culmbach; 6 miles N. of Neuſtadt.

LINDENAU, a town of Pruſſia, in the palatinate of Thorn; 20 miles N.E. of Culm.—Alſo, a town of Sileſia, in the principality of Neiſſe; 6 miles N.W. of Patſchkau.

LINDENBERG, a town of Germany, in the principality of Bayreuth; 9 miles E.S.E. of Bayreuth.

LINDENBRUCH, Frederic, in *Biography*, a learned philologiſt of the ſeventeenth century, was a native of Flanders, and died in 1638. He wrote notes on Terence, on the fragments of certain Latin poets, and on Ammianus Marcellinus. He alſo publiſhed "Codex Legum-Antiquarum, ſeu Leges Wiſigothorum, Burgundionum, Longobardorum, &c." which is eſteemed a very curious work. Moreri.

LINDENFELS, in *Geography*, a town of Germany, in the palatinate of the Rhine; 14 miles N.N.E. of Manheim.

LINDENHARDT, a town of Germany, in the principality of Bayreuth; 9 miles S. of Bayreuth.

LINDER, a town of Iſtria; 12 miles N.N.E. of Pedena.

LINDERA, in *Botany*, a name dedicated by Thunberg to the memory of John Linder, a phyſician at Stockholm, afterwards ennobled by the name of Lindeſtolpe, who was born in the year 1678, and died in 1724. He was a celebrated Swediſh botaniſt, and author of the *Flora Wikſbergenſis*, publiſhed at Stockholm in 1728. His inaugural theſis "*de Heſperidum pomis*" was publiſhed at Abo in 1702. About ſix years afterwards appeared his treatiſe "de Venenis" printed at Leyden; a poſthumous edition of which was publiſhed at Leipſic in 1739, under the direction of M. Stenzelius. This is ſaid to be a maſterly diſſertation on vegetable poiſons.—He was alſo the author of an eſſay upon the colouring properties of ſeveral Swediſh plants, particularly of ſome Lichens.—Thunb. Jap. 9. Nov. Gen. 64. Schreb. 232. Willd. Sp. Pl. v. 2. 230. Juſſ. 429. Lamarck Illuſtr. t. 263.—Claſs and order, *Hexandria Monogynia*. Nat. Ord. *Incertæ ſedis*, Juſſ.

Gen. Ch. *Cal.* Perianth none. *Cor.* Petals ſix, ovate, obtuſe. *Stam.* Filaments ſix, many times ſhorter than the corolla; anthers very ſmall. *Piſt.* Germen ſuperior, ovate, ſmooth; ſtyle erect, a little ſhorter than the corolla; ſtigmas two, reflexed. *Peric.* Capſule of two cells. *Seeds* . . . . .

Eſſ. Ch. Corolla of ſix petals. Capſule of two cells.

1. *L. umbellata.* Thunb. Japon. 145. t. 21. Linn. Syſt. Veg. ed. 14. 339. (Kuro Noſji; Kæmpf. Amœn. 908.) Found on the mountains of Japan, flowering in April and May.—*Stem* ſhrubby, branched, ſpreading and weak. *Branches* alternate, zigzag, ſmooth. *Leaves* cluſtered at the extremity of the branches, on footſtalks, oblong, acute, undivided, about an inch long; ſmooth and green above; hairy and paler beneath. *Flowers* terminal, in ſimple, many-flowered umbels.

Thunberg informs us that the Japoneſe make ſmall bruſhes of the wood of this plant for cleaning the teeth.

Lindera is alſo the name of a genus in Adanſon, Familles des Plantes, v. 2. 499, by which he ſeems to have intended to honour Dr. Lindern. (See Lindernia.) His plant appears to be a *Chærophyllum*.

LINDERKREUZ, in *Geography*, a town of Saxony, in the circle of Neuſtadt; 8 miles N.W. of Weyda.

LINDERNIA, in *Botany*, ſo called by Allioni, in honour of Francis Balthazar von Lindern, a phyſician at Straſburg, who lived in the early part of the laſt century, and appears to have graduated at Jena, where his inaugural diſſertation, "*de Vermibus*," was publiſhed in 1707.—As a botaniſt he is known from the following works, *Tournefortius Alſaticus*, publiſhed in 8vo. at Straſburg, in 1728,—and *Hortus Alſaticus*, in 1747. The latter contains an account of the plants growing in the province of Alſatia, and eſpecially about Straſburg. Both the works are accompanied by a few plates.—Allion. Ped. v. 1. 57. Linn. Mant. 154. Schreb. 416. Willd. Sp. Pl. v. 3. 325. Mart. Mill. Dict. v. 3. Juſſ. 122. Brown. Prodr. Nov. Holl. 440. Lamarck Illuſtr. t. 522.—Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. *Scrophulariæ*, Juſſ.

Gen. Ch. *Cal.* Perianth of five, deep linear, acute, equal, permanent diviſions. *Cor.* of one petal, gaping, two-lipped; upper lip very ſhort, concave, emarginate; lower erect, trifid, the middle ſegment rather larger. *Stam.* Filaments four, in pairs, the two upper ones ſimple, the two lower aſcending, with a terminal, ſtraight tooth; anthers twin, the lower ones as it were lateral. *Piſt.* Germen ſuperior, ovate; ſtyle thread-ſhaped; ſtigma emarginate. *Peric.* Capſule oval, of one cell and two valves. *Seeds* numerous. *Recept.* cylindrical.

Eſſ. Ch. Calyx deeply five-cleft. Corolla ringent, the upper lip very ſhort. The two inferior ſtamens having a terminating tooth and a ſublateral anther. Capſule of one cell.

1. L. *Pyxidaria.* Linn. Mant. 252. Allion. Miſc. Taur. v. 3. 178. t. 5. Icon. Taur. v. 16. t. 84. (Capraria gratioloides; Linn. Sp. Pl. 876. Pyxidaria repens annua; Lindern. Tournef. Alſat. 156. t. 5. Hort. Alſat. 269. Gratiola floribus pedunculatis; Gron. Virg. 3.)—Leaves oval, entire, ſeſſile. Peduncles ſolitary.—Originally a native of Virginia, in ſpongy, inundated marſhes, whence it was brought into Europe, and may at preſent be found in ſimilar ſituations, in Alſace and Piedmont, flowering in July and Auguſt.—*Root* annual. *Stem* ſmooth, ſquare, brittle, occaſionally branched and creeping. *Leaves* oppoſite, ſmall, ſlightly notched, like thoſe of Anagallis. *Flowers* axillary, ſolitary, of a pale blue colour.

2. L. *dianthera.* Swartz. Prod. 92. Ind. Occ. 1058. (Erinus procumbens; Mill. Dict. n. 6.)—Leaves on footſtalks, ovate or roundiſh, ſlightly ſerrated. Stem creeping. —A native of moiſt ſand or clay in Hiſpaniola.—*Root* thread-ſhaped, with ſhort fibres. *Stem* herbaceous, looſely ſpreading. *Branches* aſcending, ſquare, ſmooth. *Leaves* oppoſite, ribbed, ſcarcely veined. *Flowers* ſmall.

3. L. *japonica.* Linn. Syſt. Veg. ed. 14. 567. Thunb. Japon. 253.—Leaves obovate, toothed, the lower ones on footſtalks. A native of Japan, where it flowers through the ſpring. *Root* annual. *Stem* herbaceous, branched, weak. *Branches* alternate, from an inch to a ſpan in length. *Radical leaves* numerous; *ſtem-leaves* few, ſeſſile, all obovate, obtuſe, toothed, very ſlightly hairy. *Flowers* in cluſters at the extremities of the branches.

Theſe two ſpecies laſt deſcribed are ſaid by the ingenious Mr. Brown, in his Prodromus to the Flora of New Holland, to be certainly different in genus from *L. Pyxidaria.* The ſame author deſcribes the three following new ſpecies of *Lindernia*, all natives of the tropical part of New Holland, though he remarks that they do not altogether accord with the original character of this genus.

L. *alſinoides.* Leaves ovate, entire or ſlightly toothed: ſtem-leaves diſtant: floral-ones ſmall. Tube of the corolla a little longer than the calyx. Stem erect.

L. *ſcapigera.* Leaves broad-ovate, nearly entire: lower ones crowded together: thoſe of the ſtem few and ſmall: floral leaves minute. Tube of the corolla twice as long as the calyx.

L. *ſubulata.* Leaves linear-awl-ſhaped, entire. Found by the Rt. Hon. ſir Joſeph Banks only.

LINDERUPOE, in *Geography*, a ſmall iſland of Denmark, in the Little Belt, near the coaſt of Sleſwick; 8 miles W.S.W. of Aſſens in the iſland of Funen.

LINDESNESS, or *the Naze*, a cape on the S. coaſt of Norway, in the North ſea, connected with the land by a very narrow iſthmus. The cape projects into the ſea about a Norway mile towards the S.W., and is about half a mile broad. The promontory is high, rocky, and barren, and has upon it twelve houſes of peaſants. N. lat. 58° 1′. E. long. 7° 12′.

LINDEWEISE, a town of Sileſia, in the principality of Neiſſe; 11 miles S.E. of Neiſſe.

LINDISFARNE, or *Holy Iſland*, an iſland ſituated in the North ſea, oppoſite to the coaſt of that portion of Durham which lies between the river Tweed and the county of Northumberland, England. It was named by the Britons Inis-Mendicante. The appellation Holy Iſland was given to it by the Engliſh from being the reſidence of ſeveral of the primitive fathers of the Saxon church. The diſtance of this iſland from the Mainland is about two miles. It is eaſily acceſſible at low water to all kinds of conveyance, but the ſands are dangerous to ſuch perſons as are unacquainted with them. The circumference of this iſland is about nine miles, and the number of acres contained in it 1020, nearly one-half of which are mere ſand-banks. The other grounds are rather of a rich ſoil; but previous to the year 1792, when the common was incloſed, only 40 acres were in tillage. The rental increaſed between the years 1790 and 1797, from 320*l.* to 396*l.* The town is ſituated on the weſt corner, and in 1798 was inhabited by 379 perſons, who were chiefly employed in fiſhing. From the names and ruins of ſeveral ſtreets it is conjectured to have been at one period much more conſiderable than it now is. In the year 635 this place was made a biſhop's ſee by king Oſwald. Its firſt prelate was a Scotchman of the name of Aiden. The church, or monaſtery, originally conſiſted of timber and thatch. St. Cuthbert, the ſaint to whom it was dedicated, was buried here; but after the Danes began their depredations, the monks removed to Cheſter-le-ſtreet, and carried the ſaint's body along with them. After their flight the invaders deſtroyed the building, which however ſeems to have been ſubſequently rebuilt, at leaſt in part. Various detached portions of this edifice are ſtill ſtanding. Portions of the church conſtitute the principal ruins. The north and ſouth walls of it are ſtill almoſt entire, though much out of the perpendicular. So likewiſe is a part of the weſt wall, but that on the eaſt is nearly level with the ground. All the arches of this church are circular, except two in the chancel and one in the north aiſle, but theſe, as well as a pointed arch over the north aiſle, ſeem to be of later date than the reſt of the building. The columns of the nave are of four kinds, very maſſy, and variouſly ornamented. The baſes and capitals are plain. Over each arch are large windows in pairs, and over them again are ſmaller arches. One of the ribs of the arch, which ſupported the tower, is ſtill ſtanding. It is richly ornamented with Saxon zigzag, as is alſo the weſtern door and ſome other arches. The ſtones of which this church is conſtructed are of a deep red colour. On the ſides moſt expoſed to the weather they are eaten into the ſemblance of honeycomb. The remains of the priory and offices lie on the ſouth ſide. The inſide of their walls is built of whin-ſtone, obtained from a rock which forms a lofty natural pier on the ſouth ſhore of the iſland. The pedeſtal of St. Cuthbert's croſs, anciently held in great veneration, and now called the *polting ſtone*, is ſituated a ſhort way to the eaſt. When a bride cannot ſtep the length of it, the ſuperſtitious reckon it ominous of future unhappineſs in the marriage ſtate. The pariſh church is a plain but ſpacious ſtructure, having ſemicircular arches on the one ſide and pointed ones on the other. The windows are long and narrow. The caſtle ſtands upon a lofty whin-ſtone rock on the ſouth-eaſt portion of the iſland. At the commencement of the civil wars it was garriſoned by the king's forces, but ſhortly after fell into the hands of the parliament. The Pretender attempted to obtain poſſeſſion of it in the year 1715. A detachment of invalids is now uſually ſtationed here. Hodgſon's Beauties of Northumberland, 8vo. 1811.

LINDO, a town, or rather the remains of a town, in the iſland of Rhodes, anciently called *Lindus*, the native place of Cleobulus, one of the ſeven wiſe men of Greece, and of Chares, who made or at leaſt began the famous coloſſus, conſecrated to the ſun, and the ſcite of a magnificent temple dedicated to Minerva. This temple is ſaid to have been built by Danaus, king of Egypt, on landing here in his flight from his own kingdom. A feſtival was celebrated here, not with bleſſings and prayers, but, as Lactantius ſays, with curſes and imprecations; inſomuch that if a good word eſcaped from any perſon preſent, it was deemed a bad omen, and the ceremony was begun anew. The veſtiges of this city, called *Lindo*, are ſeated in a hamlet nearly in the middle of the E. ſide of the iſland, and altogether peopled by Greeks; its harbour, though far from being ſpacious, is much frequented by the ſmall craft of the country; which there take in the commodities of the iſland and bring thither merchandiſe from other parts. Accordingly almoſt all the inhabitants of Lindo are addicted to commerce, or to the carrying trade of the neighbouring coaſts and iſlands; they navigate with ſmall faſt-ſailing veſſels conſtructed by themſelves, and to which they give greater ſolidity than the ſhips which come off the ſtocks of Rhodes, on account of government. A few Lindians alſo employ themſelves in rural labours, but as the part of the iſland which they inhabit is leſs capable of tillage than any other parts, on account of its ſtony ſoil, their culture principally conſiſts of plantations of vines, fig-trees, and ſuch others; 14 miles S.S.W. of Rhodes. N. lat. 36° 17′. E. long 27° 38′. Sonnini.

LINDON, a ſmall iſland on the W. ſide of the gulf of Bothnia. N. lat. 60° 55′. E. long. 16° 57′.

LINDOW, a town of Brandenburg, in the Middle Mark; 33 miles N.N.W. of Berlin. N. lat. 52° 57′. E. long. 13 .—Alſo, a town of Brandenburg, in the Middle Mark; 8 miles S.S.W. of Franckfort on the Oder.

LINDSÆA, in *Botany*, a genus of ferns, ſo named by the late Mr. Dryander, after Mr. John Lindſay, "an aſſiduous and ſkillful botaniſt of Jamaica," author of a paper, printed in the Tranſactions of the Linnæan Soc. v. 2. 93, on the germination and raiſing of ferns from the ſeed; as well as of another paper, in the ſame vol. p. 313, concerning the raiſing of ſeveral other cryptogamic plants in the ſame manner. Dryandr. Tr. of Linn. Soc. v. 3. 39. Sm. Mem. de l'Acad. de Turin, v. 5. 413. t. 9. f. 4. Tracts on Nat. Hiſt. 242. t. 1. f. 4. Swartz. Fil. 118. Brown Prodr. Nov. Holl. v. 1. 156.—Claſs and order, *Cryptogamia Filices*. Nat. Ord. *Filices dorſiferæ*, Linn. Juſſ.

Gen. Ch. *Capſules* annulated, in continued, nearly marginal, lateral or terminal, lines. *Involucrum* ariſing from the ſurface of the leaf, membranous, continued, entire or ſlightly crenate, at length reflexed, permanent.

Eſſ. Ch. *Fructification* in continued, nearly marginal, lines. *Involucrum* from the ſurface of the leaf, continued, ſeparating at the ſide towards the margin.

Nine ſpecies are deſcribed in Mr. Dryander's original eſſay, to which five are added by Dr. Swartz, one by M. Labillardiere and one by Mr. Brown.

1. L. *ſagittata*. Dryandr. n. 1. (Adiantum ſagittatum; Aubl. Guian. 964. t. 366.)—Frond ſimple, arrow or heart-ſhaped, with a taper point.—Native of woods and fiſſures of rocks in Guiana. The *root* is creeping, bearing five or ſix *fronds* in a cluſter, near a ſpan high; the *ſtalks* black and ſhining; *leaf* ſmooth, with dichotomous veins all ſpringing from its baſe where the ſtalk is inſerted; line of fructification about a ſtraw's breadth from the edge.

2. L. *reniformis*. Dryandr. n. 2. Tr. of Linn. Soc. v. 3. t. 7. f. 1.—Frond ſimple, kidney-ſhaped, obtuſe.—Native of Guiana and Surinam.—Much like the laſt, of which we are inclined to ſuſpect it a variety.

3. L. *enſifolia*. Swartz n. 3.—Frond pinnate; leaflets alternate, ſword-ſhaped.—From the iſland of Mauritius. We have what anſwers to this character, from Madagaſcar; but if right, it is very nearly allied to the following.

4. L. *lanceolata*. Brown. n. 2. Labill. Nov. Holl. v. 2. 98. t. 248. f. 1.—Frond pinnate; leaflets alternate, linear-lanceolate, ſometimes pinnatifid; ſtalk ſquare.—Found by Labillardiere at Van Diemen's land; by Mr. Brown in the tropical part of New Holland. Each *leaflet* is about one and a half inch or two inches long, nearly ſeſſile. If the dichotomous form, and great diſtance of the lateral veins from each other, which are very remarkable characters in Labillardiere's plate, be correct, this ſpecies is eſſentially diſtinct from the laſt, whoſe veins compoſe an uniform ſort of network, interbranching with each other over the whole diſk of the leaf.

5. L. *grandifolia*. Frond pinnate; leaflets oppoſite, elliptic-lanceolate, pointed. Fructification half way between the rib and the margin.—Gathered in Malacca.—We know this merely from a pencil ſketch taken by the younger Linnæus, marked with the native country of the plant, and a note ſaying it "probably conſtitutes a new genus, of which Aublet's tab. 365 and 366, and an *Adiantum* of Smeathman's, are other ſpecies." This was perhaps written at ſir Joſ. Banks's; but if ſo, we cannot account for Mr. Dryander's having omitted this ſpecies, which appears to be one of the moſt remarkable of the whole number. The *frond* conſiſts of two pair of oppoſite, ſlightly ſtalked, leaflets, three or four inches long, with a terminal one ſtill longer. A line of fructification lies midway between the rib and the margin, on each ſide of the former; but none of the lines extend either to the baſe or the ſummit, by near an inch.

6. L. *linearis*. Swartz n. 4. 318. t. 3. f. 3.—Frond pinnate, linear; leaflets very numerous, fan-ſhaped, finely crenate and fructifying at their outer edge.—Native of various parts of New Holland. We have it from Port Jackſon. About a foot high, with a dark poliſhed *ſtalk*, tapering and zigzag at the baſe. The *leaflets* are imperfectly oppoſite, deflexed, ſmall, broad and very ſhort, ſo as to give a remarkable narrowneſs to the ſhape of the whole frond.

7. L. *falcata*. Dryander. n. 3. t. 7. f. 2.—Frond pinnate; leaflets ſomewhat creſcent-ſhaped, entire, wavy.—Gathered by Aublet in Guiana.—About a foot high, with ſeveral

pair of rather cloſe *leaflets*, each about an inch long, ſlightly falcate backward, wavy at their upper edge, along which runs the line of fructification. The terminal *leaflet* is irregularly ſhaped

8. L. *heterophylla*. Dryandr. n. 4. t. 8. f. 1. – Frond pinnate; leaflets entire or ſerrated; the lower ones ſomewhat rhomboid-lanceolate, pointed; the upper rhomboid and very obtuſe; the uppermoſt confluent.—Gathered by Mr. Robertſon at Malacca. A ſpan high, with very various, ſlightly diſtant *leaflets*, the longeſt of which meaſure ſcarcely an inch.

9. L. *cultrata*. Swartz. n. 7. (Adiantum cultratum; Willd. Phytogr. faſc. 1. 14. t. 10. f. 2.). Frond pinnate; leaflets oblong, obtuſe, wavy at their upper margin; the terminal one elongated jagged. Native of the coaſt of Malabar.—*Frond* about five inches high, with a green *ſtalk*, 10 or 12 pair of alternate, ſtalked, horizontal *leaflets*, and a ſingularly jagged, elongated, upright terminal one.

10. L. *flabellulata*. Dryandr. n. 5. t. 8. f. 2.—Frond pinnate; leaflets fan-ſhaped, finely toothed; the lower ones of the old plants compound. Native of China, Macao, and Sumatra.—The *leaflets* are almoſt ſemicircular at their fructifying edge, which ſtands outwards, not uppermoſt.

11. L. *trapeziformis*. Dryandr. n. 6. t. 9. – Frond doubly pinnate; leaflets quadrangular, abrupt; the lowermoſt fanſhaped. – Gathered in Grenada by Smeathman; ſee our n. 5. —A large and handſome fern, each branch of whoſe *frond* conſiſts of above a dozen pair of oblong quadrangular leaflets, fructifying at their upper and outer margins.

12. L *guianenſis*. Dryandr. n. 7. (Adiantum guianenſe; Aubl. Guian. 962. t. 365.)—Frond doubly pinnate; its branches ſpreading, tapering; leaflets crowded; the lower lunate; middle ones ſquare; upper fan-ſhaped.- Gathered by Aublet at the bottoms of little hills in the foreſts of Guiana. This is a very handſome *fern*, two or three feet high, with a longiſh *ſtalk*, and about ſix pair of nearly oppoſite, tapering, widely ſpreading *branches*, each compoſed of innumerable, crowded, light green *leaflets*, more or leſs rounded in their upper or fore-part, which is bordered with a broad brown line of fructification.

13. L. *ſtricta*. Dryandr. n. 8. Swartz Ind. Occ. 1722. (Adiantum ſtrictum; Swartz Prodr. 135.)—Frond doubly pinnate; branches erect, contracted; leaflets trapeziform.- Native of Jamaica, Porto Rico, and Panama. —No figure of this ſpecies has yet appeared.

14. L. *media*. Brown n. 3. Frond doubly pinnate; deltoid; leaflets obovato-rhomboid, coriaceous; the lower ones lobed; the reſt entire; with a ſolitary uninterrupted line of fructification at the fore edge; the barren ones ſerrated at the top; ſtalk ſquare. Gathered by Mr. Brown in the tropical part of New Holland

15. L. *trichomanoides*. Dryandr. n. 9. t. 11.—Frond doubly pinnate; leaflets membranous, linear-clubſhaped, abrupt.—Gathered at Duſky bay, New Zeeland, by Mr. A. Menzies. A delicate ſpecies, a ſpan high, with ſlender creeping downy *roots*, and ſmooth brown *ſtalks*. The *leaflets* vary in ſize and breadth, but are nearly wedge-ſhaped, decurrent and confluent, of a light green colour and ſomewhat membranous texture, ſo as much to reſemble a *Trichomanes* or *Hymenophyllum*; their ſummit abrupt, crenate or jagged. Line of *fructification* ſometimes very ſhort; the *involucrum* broadiſh, ſcarcely ever reflexed, but finally deciduous, along with the capſules.

16. L. *tenera*. Dryandr. n. 10. t. 10.—Frond triply pinnate, triangular; leaflets obovate, ſomewhat rhomboid, cut.—Native of the Eaſt Indies; ſent to ſir Joſeph Banks by the Moravian miſſionaries from the iſland of Nicobar. It appears to us as truly pinnate as any of the others, rather than pinnatifid, though the ultimate diviſions, or *leaflets*, are decurrent; theſe are broader and more rounded than in the laſt, as well as lobed or cut.

17. L. *microphylla*. Swartz n. 14. 319.—Frond lanceolate, triply pinnate; leaflets wedge-ſhaped, dilated and crenate at the top. Gathered near Port Jackſon, New South Wales, by Dr. White. This elegant ſpecies is a foot and a half, or more, in height; the whole *frond* of a narrow lanceolate figure, with ſlender, lax, pinnate branches, and ſmall, light green dotted *leaflets*, which are wedge-ſhaped, tapering at the baſe, always crenate at the ſummit, as is alſo the *involucrum*. Every *leaflet* is ſuddenly dilated oppoſite to each end of the fructifying line.

The three laſt ſpecies are naturally allied to the genus *Davallia* (ſee that article), with which they agree as to habit, and occaſionally even in the ſhort round figure of their fructification and involucrum, which in general however are continued in a ſubmarginal line.

LINDSAY, JOHN, in *Biography*, a learned nonjuring divine, who was educated at St. Mary-Hall, Oxford. He had a congregation in London, among whom he regularly officiated, and was employed by Mr. Bowyer as a corrector of the preſs. He tranſlated Maſon's "Vindication of the Church of England;" and wrote "A Short Hiſtory of the Royal Succeſſion;" and "Remarks on Whiſton's Scripture Politics." He died in 1768, aged 82.

LINDSAY, *Sir* **DAVID**, a Scotch poet, was a native of the county of Fife, and educated at the univerſity of St. Andrews. He was at the battle of Pavia, and on his return to Scotland James V. appointed him maſter of the herald's office. He wrote ſeveral poems, ſome of which have been printed, particularly his Satires on the Clergy. He died in 1557, aged 61. There was another of this family named David likewiſe, who was born about the year 1527: he was a zealous promoter of the reformation, and died in 1592. He wrote the Hiſtory of Scotland from 1437 to 1542.

LINDSEY, THEOPHILUS, was born at Middlewich, in Cheſhire, June 20th, 1723, old ſtyle. His father, Mr. Robert Lindſey, was an opulent proprietor of the ſalt-works in that neighbourhood; his mother's name was Spencer, a younger branch of the Spencer family, in the county of Buckingham. Theophilus was the ſecond of three children, and ſo named after his godfather, Theophilus, earl of Huntingdon. He received the rudiments of grammar learning at Middlewich, and from his early attachment to books, and the habitual ſeriouſneſs of his mind, he was intended by his mother for the church. He loſt ſome time by a change of ſchools, till he was put under the care of Mr. Barnard of the free-ſchool of Leeds, under whom he made a rapid progreſs in claſſical learning. At the age of eighteen he was admitted of St. John's college, Cambridge, where, by exemplary diligence and moral conduct, he obtained the entire approbation of his tutors. As ſoon as he had finiſhed his ſtudies at college, taken his firſt degree, and had been admitted to deacon's orders, he was nominated by ſir George Wheeler to a chapel in Spital ſquare, London. Soon after this, he was, by the recommendation of the earl of Huntingdon, appointed domeſtic chaplain to Algernon, duke of Somerſet. The duke, from a great regard for his merit, determined to procure him a high rank in the church, but an early death deprived Mr. Lindſey of his illuſtrious patron. In 1754, he accompanied the preſent duke of Northumberland to the continent, and on his return he ſupplied, for ſome time, the temporary vacancy of a good living in the north of England, called Kirkby-Wiſk: here he became acquainted with Mr. archdeacon Blackburne, and in 1760 married his daughter-in-law. From Kirkby Mr. Lindſey went to Piddletown, in Dorſetſhire, having been preſented to the living of that place by the earl of Huntingdon: this, through the intereſt of the ſame patron, he exchanged, in 1764, for the vicarage of Catterick, in Yorkſhire. Here he reſided nearly ten years, an exemplary pattern of a primitive and conſcientious paſtor, highly reſpected and beloved by the people committed to his charge. Beſides his various and important duties as a pariſh clergyman, Mr. Lindſey was ever alive, and heartily active, in every cauſe in which the principles of truth and right reaſon were concerned. We accordingly find him, in 1771, zealouſly co-operating with Mr. archdeacon Blackburne, Dr. John Jebb, Mr. Wyvil, and others, in endeavouring to obtain relief in matters of ſubſcription to the thirty-nine articles: the object of theſe gentlemen was ſimply this, that the clergy of the eſtabliſhed church might be permitted to hold their preferments upon condition of merely ſubſcribing their belief of the holy ſcriptures, inſtead of the thirty-nine articles. The queſtion was brought before the houſe of commons in 1772, but after a very animated diſcuſſion, it was loſt by a great majority. Conſidering the iſſue of this debate as an abſolute diſappointment and refuſal of all their juſt and righteous demands, he began to conſider what courſe he ſhould take to ſatisfy his conſcience, and in a ſhort time explicitly avowed his intentions of reſigning his living. He had, probably, for ſome years, had doubts with reſpect to the doctrine of the Trinity, and other leading topics of the eſtabliſhed faith, and early in the year 1773 an anonymous writer, under the ſignature of Lælius, ſtarted the ſubject of the impropriety of perſons remaining in the church who could not conſcientiouſly conform to her principles: to this Mr. Lindſey, in a letter to a friend, moſt feelingly alludes; "The ſubject of Lælius's laſt letter may give one many a pang. I cannot ſay that I have been for many years a day free from uneaſineſs about it." In the following November he wrote to the prelate of his dioceſe, informing him of his intention to quit the church, and ſignifying, that in a few days he ſhould tranſmit to him his deed of reſignation. The biſhop endeavoured to perſuade him to remain at his poſt, but he had made up his mind that duty required the ſacrifice, and he was reſolved to bear the conſequences. When the act was done, he ſaid he felt himſelf delivered from a load which had long lain heavy upon him, and at times nearly overwhelmed him. Previouſly to his quitting Catterick, Mr. Lindſey delivered a farewell addreſs to his pariſhioners, in which he ſtated his motives for quitting them in a ſimple and very affecting manner, pointing out the reaſons why he could no longer conduct, nor join in their worſhip, without the guilt of continual inſincerity before God, and endangering the loſs of his favour for ever. He left Catterick about the middle of December, and after viſiting ſome friends in different parts of the country, he arrived in London in January 1774, where he met with friends, who zealouſly patronized the idea which he entertained of opening a place of worſhip, devoted entirely to Unitarian principles. A large room was at firſt fitted up for the purpoſe in Eſſex-ſtreet in the Strand, which, after overcoming ſome legal obſtacles, thrown out by the magiſtrates in the way of regiſtering it, was opened April 17, 1774. The ſervice of the place was conducted according to the plan of a liturgy which had been altered from that uſed in the eſtabliſhed church by the late Dr. Samuel Clarke, rector of St. James's church, Piccadilly, London. Mr. Lindſey publiſhed the ſermon which he preached on the opening of his chapel, to which was added an account of the liturgy made uſe of. About the ſame time he publiſhed his "Apology," of which ſeveral editions were called for in the courſe of a few years. This was followed by a ſtill larger volume, entitled "A Sequel to the Apology," which was intended as a reply to his various opponents, and likewiſe to vindicate and eſtabliſh the leading doctrines which he profeſſed, and on account of which he had given up his preferment in the church. This work was publiſhed in 1776, and in 1778 he was enabled, by the aſſiſtance of his friends, to build the chapel of Eſſex-ſtreet, and to purchaſe the ground on which it ſtands. Till the ſummer of 1793, Mr. Lindſey, with the aid of his friend the Rev. Dr. Diſney, conducted the ſervices of the place, upon ſtrict Unitarian principles, to a reſpectable and numerous congregation. He then reſigned the whole into the hands of his very able coadjutor, notwithſtanding the earneſt wiſhes of his hearers that he ſhould ſtill continue a part of the ſervices. Though he had quitted the duties of the pulpit, he continued to labour in the cauſe, by his publications, till he had attained his eightieth year. In 1802 he publiſhed his laſt work, entitled "Converſations on the Divine Government, ſhewing that every Thing is from God, and for good to all." The object of this piece, which has been reprinted for general circulation by a ſociety for promoting Chriſtian knowledge, &c. is to vindicate the Creator from thoſe gloomy notions which are too often attached to his providence, and to ſhew that the government of the world is the wiſeſt that could have been adopted, and that afflictions and apparent evils are permitted for the general good. From this principle Mr. Lindſey derived conſolation through life, and upon it he acted in every difficult and trying ſcene. On his death bed he ſpoke of his ſufferings with perfect patience and meekneſs, and when reminded, by a friend, that he doubtleſs was enabled to bear them with ſo much fortitude in the recollection of his favourite maxim, that "Whatever is, is right;" no, ſaid the dying Chriſtian, with animation that lighted up his countenance, "Whatever is, is beſt." This was the laſt ſentence which he was able diſtinctly to articulate: he died November 3, 1808. Beſides the works already referred to, he publiſhed two diſſertations; 1. On the Preface to St. John's Goſpel; 2. On praying to Chriſt: "An Hiſtorical View of the State of the Unitarian Doctrine and Worſhip from the Reformation to our own Times;" and ſeveral other pieces. Among controverſial writers Mr. Lindſey takes a very reſpectable place, as his "Vindiciæ Prieſtleianæ," and his "Examination of Mr. Robinſon's Plea for the Divinity of Chriſt," will ſhew. In every character of life which this excellent man ſuſtained, he acted his part with honour and integrity, and for his exertions in the cauſe of truth and rational Chriſtianity, whatever may be thought of his peculiar opinions, many will riſe up and call him bleſſed. Others, equally devout, equally humble, equally perſevering, will be forgotten when the name of Theophilus Lindſey ſhall be held in veneration, becauſe to humility, piety, and perſeverance, he added a courageous avowal of what he believed to be the truth: he bore public teſtimony, in oppoſition to the penal laws, in matters of faith, that ſtill exiſt on our ſtatute-book, to the unity of God at the hazard of all. Two volumes of his ſermons have been publiſhed ſince his death. Monthly Mag. Dec. 1808.

LINDUM, in *Ancient Geography*, a town of Britain, in the country of the Coretani, which by the 5th Iter of Antonine is ſituated between Cauſennæ or Ancaſter, and Segelocum or Littleborough. This is univerſally agreed to be Lincoln, which was a Roman colony, and a place of great importance in ancient times. Baxter, without ſufficient authority, contends that Lindum was the Lendinium in which ſo many of the Romans were ſlain by the Britons in their great revolt under Boadicea. See LINCOLN.

LINDUM was alſo the name of a place in the country of the Dumnii; which, in both the ſound and ſignification of the name, bears ſo great a reſemblance to Linlithgow, that it is moſt probably the ſame place, though its ſituation does not exactly agree with that aſſigned by Ptolemy, who is far from being correct in this particular,

LINDY, in *Geography*, a town of Africa, in Querimba, S. lat. 9° 58′. E. long. 41° 4′.

LINE, in *Geometry*, a quantity extended in length only, without either breadth or thickneſs.

A line is ſuppoſed to be formed by the flux or motion of a point; and is to be conceived as the termination or limit of a ſurface, and not as a part of that ſurface, however ſmall.

There are two kinds of lines; *viz. right* lines, and *curve* lines.

If the point A moves towards B (*Pl.* X. *Geometry*, *fig.* 1.) by its motion it deſcribes a line: and this, if the point go the neareſt way towards B, will be a right or ſtraight line, whoſe definition therefore is the neareſt or ſhorteſt diſtance between any two points, or a line, all whoſe points tend the ſame way. If the point go any way about, as in the lines A C B, or A *c* B, it will trace out either a crooked line, as the upper A *c* B; or elſe two or more ſtraight ones, as in the lower A C, C B.

Right lines are all of the ſame ſpecies: but curves are of an infinite number of different ſpecies; we may conceive as many as there are different compound motions, or as many as there may be different ratios between their ordinates and abſciſſas.

Curve lines are uſually divided into *geometrical* and *mechanical*. The former are thoſe which may be found exactly and ſecurely in all their points. (See Geometrical *line*.) The latter are thoſe, ſome or all of whoſe points are not to be found preciſely, but only tentatively, or nearly.

Accordingly, Deſcartes and his followers define *geometrical* lines, thoſe which may be expreſſed by an algebraic equation of a determinate degree; which equation is alſo called *locus*.

The ſame perſons define *mechanical* lines thoſe which cannot be expreſſed by an equation of a determinate degree. Others, conſidering that thoſe called by Deſcartes *mechanical* lines, notwithſtanding their not being of a determinate degree, are not leſs preciſe and exact, and conſequently not leſs geometrical than the others; it being this preciſion which conſtitutes the geometricity of the line: for this reaſon, chooſe rather to call thoſe lines which are reducible to a determinate degree, *algebraical* lines; and thoſe which are not, *tranſcendental* lines.

Lines are alſo divided into thoſe of the *firſt order*, *ſecond order*, *third order*, &c. See Curve.

Sir Iſaac Newton enumerated ſeventy-two lines of the third order, and Mr. Stirling found four more; ſince that Mr. Stone has found two others, which had eſcaped ſir Iſaac and Mr. Stirling. The two ſpecies added are to be reckoned among the hyperbolico-parabolical curves. Enumer. Lin. Tert. Ordin. Linea. Tert. Ordin. Neutonianæ, Oxon. 1717. 8vo. Phil. Tranſ. N° 456. § 6. See Curve.

Lines, conſidered as to their poſitions, are either *parallel*, *perpendicular*, or *oblique;* the conſtruction and properties of each whereof, ſee under Parallel, Perpendicular, &c.

Euclid's ſecond book treats moſtly of lines, and of the effects of their being divided, and again multiplied into one another.

Lines, *Algebraic*, are divided into different orders, according to the degree of their equations. Theſe degrees are eſtimated, as in determined equations, by the degree of the higheſt term of the equation.

Thus $a + by + cx = 0$, is a general equation, expreſſing the nature of lines of the firſt order, or of ſtraight lines.

The equation $a + by + cx + dyy + exy + fxx = 0$, repreſents the lines of the ſecond order; that is, the conic ſections, and the circle, which is one of them.

And the equation $a + by + cx + dyy + exy + fxx + gy^3 + hxyy + ix^2y + lx^3 = 0$, expreſſes in general the lines of the third order. And the lines of the fourth and higher orders may be expreſſed in the like manner. See Cramer Introd. à l'Analyſe des Lignes Courbes, p. 52, ſeq. Mr. Cramer uſes the terms *lines* of the ſecond, third, fourth, &c. order, and *curve* of the ſecond, third, fourth, &c. order, indifferently. Sir Iſaac Newton has made a diſtinction, according to him. See Curve.

Lines, *circular*, *converging*, *diverging*, *generating*, *heliſpherical*, *hyperbolic*, *logiſtic*, *magnetical*, *normal*, *proportional*, *quadrature*, *reciprocal*, *robervalian*, and *vertical*. See the reſpective adjectives.

Line *of the Apſides*, in *Aſtronomy*, is the line which joins the apſides; or it is the greater axis of the orbit of a planet.

Line, *Fiducial*, the line or ruler which paſſes through the middle of an aſtrolabe, or the like inſtrument; and on which the ſights are fitted; otherwiſe called *alhidade*, *index*, *dioptra*, and *mediclinium*.

Line, *Horizontal*, a line parallel to the horizon.

Lines, *Iſochronal* and *Meridian*. See the adjectives.

Line *of the Nodes*, in *Aſtronomy*, is the line which joins the nodes of the orbit of a planet, or the common ſection of the plane of the orbit with the plane of the ecliptic.

Line, *Horizontal*, in *Dialling*, is the common ſection of the horizon, and the dial-plate.

Lines, *Horary*, or *Hour-lines*, are the common interſections of the hour-circles of the ſphere, with the plane of the dial. See Horary, and Hour-*circles*.

Line, *Subſtylar*. See Substylar.

Line, *Equinoctial*, is the common interſection of the equinoctial, and the plane of the dial.

Line, *Contingent*. See Contingent.

Lines, *Dialling* and *Meridian*. See the reſpective adjectives.

Line, in *Fencing*, is that part of the body directly oppoſite to the enemy, wherein the ſhoulders, the right arm, and the ſword, ought always to be found; and wherein are alſo to be placed the two feet, at the diſtance of eighteen inches from each other.

In this ſenſe, a man is ſaid to be in his line, to go out of his line, &c.

Line, in *Fortification*, is ſometimes taken for a ditch, bordered with its parapet; and ſometimes for a row of gabions, or ſacks of earth, extended lengthwiſe on the ground, to ſerve as a ſhelter againſt the enemy's fire.

When the trenches were carried on within thirty paces of the glacis, they drew two lines, one on the right, and the other on the left, for a place of arms.

For the difference between trenches or approaches, and lines, ſee Intrenchment.

Lines are generally made to ſhut up an avenue or entrance to ſome place; the ſides of that entrance being covered by rivers, woods, mountains, moraſſes, or other obſtructions, not eaſy to be paſſed over by an army. When they are conſtructed in an open country, they are carried round the place to be defended, and reſemble the lines ſurrounding a camp, called lines of circumvallation. Lines are likewiſe thrown up to ſtop the progreſs of an army; but the term is moſt commonly applied to the line which covers a paſs that can only be attacked in front. For conſtructing ſuch a line in the place moſt convenient for the purpoſe, let a rope be run quite acroſs the way along the intended place of the line, pegging it to the ground at the diſtance of every four or five yards; and at the diſtance of about ten or twelve feet before the line, towards the enemy, let ſuch another line or row of ſtakes be carried in a poſition parallel to the firſt rope. When the labourers are properly ranged within theſe limits, let them dig up the earth in this breadth, and throw it on the other ſide of the firſt rope, until a bank of about five or ſix feet thick, and ſix or ſeven feet high, be raiſed, ſloping the ſides according to the declivity neceſſary for the earth's rolling naturally down the bank; and let the digging be continued till the ditch is about five or ſix feet deep, the breadth of the bottom being about one-third of the breadth ſtaked out at top: the bank may be rendered more firm by being trod or rammed down. Let the inner ſide of the bank be pared with the ſpade into ſuch a ſlope, as a man ſtanding upright may eaſily touch with his arm extended ſtraight before him; and at the foot of this bank, let a foot-bank or ſtep be raiſed, of ſuch a height, as a man ſtanding on it may eaſily fire his muſket over the bank, or let it be about four feet and a half lower than the top of the bank or breaſt-work. A gentle ſlope may alſo be made to the foot-bank, that the troops may more eaſily aſcend it; and let the crown or top of the breaſt-work be ſloped ſo, that a muſket laid flat on it may ſtrike the ground with its ſhot, about five or ſix feet beyond the ditch. The bank or breaſt-work will, in this caſe, ſecure the troops behind the lines from the enemy's fire; and when they ſtand on the foot-bank, they are more than two-thirds covered, and, conſequently, the troops within may make three of their ſhots tell for one of the enemy; and by going off the foot-bank, they may be quite covered, while they load again; ſo that with this advantage, they are in no great danger of being forced from the lines, unleſs the enemy are greatly ſuperior in number and cannon.

The following Table ſhews the dimenſions of lines commonly conſtructed, and the rate of expence attending the conſtruction of them.

Breaſt-Work.			Ditch.			Expence.	
Thickneſs at top.	Height within.	Height without.	Upper breadth.	Lower breadth.	Depth.	Solid Content.	Days' works.
Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	
4	$7\frac{1}{2}$	6	8	$2\frac{2}{3}$	5	$4\frac{2}{3}$	1
5	$7\frac{1}{2}$	6	10	$3\frac{1}{4}$	$5\frac{1}{2}$	$6\frac{1}{12}$	$1\frac{1}{2}$
6	$7\frac{1}{2}$	6	12	4	6	8	2
7	$7\frac{1}{2}$	6	14	$4\frac{2}{3}$	$6\frac{1}{2}$	10	$2\frac{1}{2}$
8	$7\frac{1}{2}$	6	16	$5\frac{1}{2}$	7	12	3
9	$7\frac{1}{2}$	6	18	6	$7\frac{1}{2}$	15	$3\frac{1}{2}$

The day's work here is for one yard in length; and in the firſt, a hundred men will complete a hundred yards in length of this kind of lines in one day; two hundred men in half a day, &c. The lines above deſcribed are called temporary lines, and chiefly ſerve a preſent emergency. When lines are thrown up at leiſure, and deſigned for longer duration, then the ditch is uſually eighteen feet broad at top, ſeven or eight feet deep, and the ſides of the ditch are ſloped, ſo as to leave only ſix feet breadth at bottom; the breaſt-work, or parapet, is about ſeven feet thick on the top or crown, and ſeven or eight feet high. The heights, depths, and breadths, of the ſeveral parts of a line well deſigned and finiſhed, are exhibited in *Plate* VI. *Fortification, fig.* 3, in which I L repreſents the ground line, or ſurface of the place; A B the breadth of the ditch at the top; C D its breadth at the bottom; F A C the ſlope or ſcarp of the parapet and ditch; D B K the counterſcarp; E F the top or crown of the parapet or breaſt-work; E G the inner ſlope of the parapet; H G the top of the foot-bank; H I the ſlope of the foot-bank; and B K L a ſmall ſloping bank, called the glacis. This ſection or profile may be drawn, by laying off in the ground-line, from any ſcale of equal parts, the diſtances $1\,a = 6$ feet, $ab = 4$, $bc = 1\frac{1}{2}$, $cd = 7$, $d\mathrm{A} = 4\frac{1}{2}$, $\mathrm{A}f = 6$, $fg = 6$, $g\mathrm{B} = 6$, and $\mathrm{BL} = 5$ feet. Through *a*, *b*, *c*, *d*, *f*, *g*, B, draw lines perpendicular to I L. Make $a\mathrm{H} = 2\frac{1}{2}$ feet $= b\mathrm{G}$, $c\mathrm{E} = 7$ feet, $d\mathrm{F} = 6$, $f\mathrm{C} = 8$ feet $= g\mathrm{D}$. Draw I H, H G, G E, E F, F A C, C D, and D B, which continue, till it meets the line F L, and the profile is conſtructed.

When lines are made to cover a camp, or a large tract of land, where a conſiderable body of troops is poſted, the work is not made in one ſtraight, or uniformly bending line; but at certain diſtances, the lines project in ſaliant angles, called redents, redans, or flankers, towards the enemy. The diſtance between theſe angles is uſually between the limits of two hundred and two hundred and ſixty yards; the ordinary flight of a muſket-ball, point-blank, being generally within thoſe limits; although muſkets, a little elevated, will do effectual ſervice at the diſtance of three hundred and ſixty yards. In *Plate* VI. *Fortification, fig.* 4, are ſhewn the forms of the uſual lines, where the figures C A B, *c a b*, are the redents or flankers; A C, A B, *a c*, *a b*, the faces; C B, *c b*, the gorges; A D, *a d*, the capitals; B *b* the curtin; and the angles C A B, *c a b*, the ſaliant or flanked angles. The diſtance of the ſaliant angles is about two hundred and forty yards at a mean; the length of the capital is uſually between forty and fifty yards, and the length of the gorges is alſo about ſixty or ſeventy yards.

To make a plan of lines with redents; draw the line E E E E, &c. (*Plate* VI. *Fortification, fig.* 5,) in ſuch a manner, that, wherever there is a bend or angle, it may be either at once, twice, or thrice, &c. the length of about two hundred and forty yards from one another; ſo that there may be a redent where there is an angle. In this line, lay off the diſtance of two hundred and forty yards from E to E, E to E, &c. reckoning from the bends towards each end, whether it happens that the line will or will not be exactly meaſured by a repetition of the two hundred and forty yards. At each point, E, draw the capital E F in a perpendicular poſition to the direction of the line in that point, and make the capitals about forty or fifty yards long. On each ſide of E, take the half gorges E G, E G, each of about thirty or thirty-five yards, and draw the faces F G, F G; and thus the out-line, or maſter-line, of the curtins and redents is formed. Parallel to each curtin and face draw lines, within, at the diſtances from the maſter-line of ſeven feet, eight feet, twelve feet, and eighteen feet; then the breadth of ſeven feet repreſents the plan of the parapet, that of one foot its inner ſlope, that of four feet the top of the foot-bank, and that of ſix feet the foot-bank ſlope. On the outſide of the maſter-line, draw lines at the diſtance of $10\frac{1}{2}$, $16\frac{1}{2}$, and $22\frac{1}{2}$ feet parallel to each curtin and face; and theſe will repreſent the plans of the ſcarp, ditch, and counterſcarp; obſerving that the ſaliant angles of the counterſcarp are rounded before the angles of the redents. A plan of this kind formed from a ſmall ſcale, as of twenty yards to an inch, is uſually repreſented by four parallel lines; one without the maſter-line, repreſenting the counterſcarp or out-line of the ditch, and two within, repreſenting the breadths of the parapet of the foot-bank. In ſome caſes, a ſhort line is haſtily formed by a number of *chevaux de friſe* chained together; and in countries abounding with wood, a line may be formed by laying, in a poſition pointing to the enemy, the ſtems of trees and their larger branches, piled on one another to a ſufficient height, and the interſtices filled with earth; ſuch a work is called an *abbatis*. See Robertſon's Marine Fort. p. 2, &c.

LINE, *Fundamental*, is the firſt line drawn for the plan of a place, and which ſhews its area.

LINE, *Capital*, in *Fortification*. See CAPITAL.

LINE, *Central*, is that drawn from the angle of the centre, to that of the baſtion.

LINE *of Defence*. See DEFENCE.

LINE *of Defence fichant*. See DEFENCE.

LINE *of Defence razant*. See DEFENCE.

LINE *of Approach*, or *Attack*, ſignifies the work which the beſiegers carry on under covert, to gain the moat, and the body of the place. See APPROACHES.

LINE *of Counter-approach*. See COUNTER-*approach*. See *Plate* VI. *Fortification*, *fig.* 6.

LINE *of Circumvallation*, is a line or trench cut by the beſiegers, within cannon-ſhot of the place, which ranges round their camp, and ſecures their quarters againſt any relief to be brought to the beſieged. See CIRCUMVALLATION.

LINE *of Contravallation*, is a ditch bordered with a parapet, which ſerves to cover the beſiegers on the ſide of the place, and to ſtop the ſallies of the garriſon. See CONTRAVALLATION.

LINES *of Communication*, are thoſe which run from one work to another. See *Plate* VI. *Fortification*, *fig.* 7. See alſo COMMUNICATION. But

The LINE *of Communication*, more eſpecially ſo called, is a continued trench, with which a circumvallation, or contravallation is ſurrounded; and which maintains a communication with all its forts, redoubts, and tenailles.

LINE *of the Baſe*, is a right line, which joins the points of the two neareſt baſtions.

To LINE *a Work*, ſignifies to face it, chiefly with brick or ſtone; *e. gr.* to ſtrengthen a rampart with a firm wall, or to encompaſs a parapet or moat with good turf, &c.

LINE, *Indented*, in *Fortification*. See REDENS.

LINES, among *Fowlers*, are uſed to expreſs the ſtrings by which they catch birds. The large and ſmall land birds are taken by them with equal eaſe, and ſometimes the water-fowl.

Theſe lines are made of long and ſmall cords, knotted in different places, and containing in length as many fathom as the places where they are to be laid require. Plovers, and the larger wild-fowl, are very conveniently taken by them. When theſe ſtrings are to be uſed, they muſt be limed with the ſtrongeſt bird-lime that can be got, and then coming to their haunts before the evening flights, that is, before ſun-ſet; or, for the morning flights, at leaſt two hours before day, the ſportſman is to carry a parcel of ſmall ſticks, each about two feet long, and ſharpened at both ends, but having a little ſlit at one end like a fork. The plain end of each ſtick is to be ſtuck into the ground, in ſuch a manner, that the ſtick ſtanding aſlant, its upper, or forked end, may be about a foot and a half from the ſurface. The limed ſtrings are then to be carried along all theſe ſticks, in different rows, ſome higher than others. Every row of the ſticks is thus to be filled, and the whole haunt covered with the lines. The plover, and other birds that fly low, when they come to their haunts, fly directly in amongſt the ſtrings, and are taken in great numbers; the whole flight coming in at once, and covering all the place, ſo that thoſe which are not yet alighted, have no opportunity of ſeeing the diſtreſs of their companions. There is no need for the ſportſman to be conſtantly upon the watch for the taking of the birds; for when once they are taken they cannot looſen themſelves, ſo that he may come and take them up at his own time. The water-fowl may be eaſily taken, in the ſame manner, by obſerving their haunts, and ſtretching theſe lines, in ſeveral rows, acroſs the brook, or river, ſome higher, and ſome lower, the loweſt lying almoſt at the edge of the water. Theſe muſt never be uſed on moonlight nights on the occaſion; for the ſhadow of the ſtrings in the water will then fright them away.

LINE, in *Genealogy*, is a ſeries of ſucceſſion or relations in various degrees, all deſcending from the ſame common father.

LINE, *Direct*, is that which goes from father to ſon; which is the order of aſcendants and deſcendants. See DIRECT.

LINE, *Collateral*, is the order of thoſe who deſcend from ſome common father, related to the former, but out of the line of aſcendants and deſcendants. In this are placed uncles, aunts, couſins, nephews, &c. See COLLATERAL. See alſo CONSANGUINITY and DESCENT.

LINE, in *Geography* and *Navigation*, is uſed by way of eminence for the equator or equinoctial line.

The line in the heavens is a circle deſcribed by the ſun in his courſe on the 20th day of March, and the 23d of September. The line on the earth is an imaginary circle anſwering to that in the heavens. It divides the earth from eaſt to weſt, into two equal parts, and is at an equal diſtance from the two poles; ſo that thoſe who live under the line have the poles always in their horizon.

The latitudes commence from the line.

The ſeamen have ſometimes practiſed the ceremony of chriſtening their freſh men, and paſſengers, the firſt time they croſs the line. See BAPTISM.

LINES, in *Heraldry*, the figures uſed in armories to divide the ſhield into different parts, and to compoſe different figures.

They are of different forms, and were it not for this, many arms would be one and the ſame, for a chief wavy differs from a plain chief, by the lines which compoſe them, and the heralds ſhew particular reaſons for all theſe different forms of lines.

Theſe lines, according to their forms and names, give denomination to the pieces or figures which they form, except the ſtraight or plain lines, which are carried evenly through the eſcutcheon, and are four, *viz.* the perpendicular line, the horizontal, the diagonal line dexter, and the diagonal line ſiniſter.

The crooked lines, which are carried unevenly through the eſcutcheon, riſing and falling, are theſe: firſt the ingrailed or engrailed, and inverted or invected; theſe, when repreſented together, are ſomewhat known the one from the other, being oppoſite to one another, both being made, as it were, of ſemicircles: the ingrailed with the points upward, the invected with the points downward. But this is not a ſufficient diſtinction: for ſuppoſe the ſpace between them which they form be a feſs, then the whole is only ingrailed, not invected; for the feſs ingrailed muſt have the points on both ſides turned towards the field, and the convex or gibboſe parts toward the feſs itſelf, and ſo of a bend, chevron, and other proper figures of heraldry; and if theſe be invected, then the convex parts of the lines are towards the field; but theſe lines are better diſtinguiſhed when placed by way of bordure, with the letters within a bordure ingrailed or invected.

Theſe two lines are more hard to be diſtinguiſhed, when the field is divided into two equal parts, of different colours, as parted per pale, parted per feſs, &c. Here we know not whether the line be ingrailed or invected, except we follow this rule, that the form of the line muſt be applied to the colour firſt named. The French terms for theſe two lines are, for the engrailed, *engrele*, and for the invected, *canele*; and the Latin writers expreſs ingrailed by *ingrediatus*, *imbricatus*, and *ſtriatus*, and the invected by the words *invertus* and *canaliculatus*.

The wavy, or waved line, is ſuch an one as is formed in repreſentation of the waves of the ſea, as parted per feſs wavy in arms and other waved lines, as the wavy bars all expreſs that the perſon got his honours by ſea ſervice.

Nebulee is another name of a line in heraldry: it expreſſes a clouded line; the French call it *nuance*, and the Latins *nebuloſa linea*. This alſo has been given to perſons who have been eminently ſkilled in navigation.

Crenele, or embattled lines, repreſent the battlements of a houſe, and are ſaid to repreſent in heraldry the ſkill in architecture, for which the firſt of the family was famous; they were alſo given ſometimes for eminent ſervices, in aſſaulting or defending caſtles in time of war, and ſometimes only as emblems of a houſe to expreſs a perſon who bore them being of a noble houſe or family; for of old, none were ſuffered to embattle their houſes but perſons of great diſtinction.

The Latin writers in heraldry uſe for the words *crenele*, the terms *pinnatus* and *pinnis aſperatus*, according to Uredus in his blazons, and Sylveſter Petra Sancta in his *murales pinnalee*.

There is another line of this kind in heraldry, which Leigh calls the battle-embattled line: this has one degree of embattling above another. When the upper points in this kind of line are repreſented ſharp, it is called campagne, as if the lines ending in points repreſented baſtions, or the outer works of cities and camps; and when the upper points are rounded, it is called crenele embattled arrondi.

The indented line is notched ſo at the edges, that it repreſents the teeth of a ſaw, and has its name from the Latin *dens*, a tooth, or from the law term *indenture*, a ſort of deed, the top of which is always notched like the teeth of a ſaw.

The dancette is another line, very much reſembling the indented line, but that it is always much ſmaller; it is therefore ſaid by the heralds to be the ſame in quality, but not in quantity. The dancette differs alſo from the indented line, in that it always conſiſts but of a few teeth, though never leſs than three, according to Mr. Holmes, in his Office of Armory; whereas the indented line has always a great many teeth. The French expreſs our indented line by the term *danche* or *dentille*; and the dancette, when it has but very few teeth, and thoſe very long, by the term *vivere*, which Meneſtrier takes to be the letter M, with its legs extended from ſide to ſide of the ſhield, becauſe many who carry a partition, or feſs, after that form, have the family name beginning with that letter. The Latin writers expreſs the term indented by *dentatus*, *indentatus*, and *denticulatus*; and when the teeth are very long, as in the dancette, they call them *dentes decumani*. See alſo NEBULY and RAGULED.

There are yet two other lines mentioned by the heraldry writers: the firſt is the *patee* or *dovetail* line, ſo called from its reſemblance to a ſort of joint uſed by our carpenters, in which one part goes alternately all the way down between two others; this is called by Morgan the inclave, or labelled line, becauſe the points, as they proceed from the ordinary, ſuch as the chief or feſs, repreſent not amiſs the points, or rather the ends of the labels. The other line is called *urdee* or *champagne* by Freſne; and by Upton, *vair*, becauſe its points are formed like pieces of the fur, called by heralds *vair*.

The two laſt of theſe are of very little uſe, the others are the common lines of arms, and are called the attributes or accidents of armorial figures which they form; and if any other lines are found in the figures or engravings of arms, which are not reducible to the one or the other of theſe, they are called *irregular*, and by the French heralds *clatte*. The knowledge and uſe of theſe forms of lines are neceſſary in the ſcience of heraldry to diſtinguiſh and difference many armorial bearings.

LINE, *Labelled*. See LABELLED.

LINE, *Lateral, linea lateralis*, in *Ichthyology*, a name given by naturaliſts to a line or ſtreak, with which many kinds of fiſh are marked, paſſing along their ſides. Few fiſh are without this line; but it is variouſly formed in the ſeveral kinds, and makes a very conſiderable article in their deſcription, if not in the diſtinction of the ſpecies. In ſome ſpecies it is made of a ſeries of little points, or holes, as appears to the eye; of this nature is the line in eels, &c. In ſome others it is formed of a ſort of duct, running along the centre of a great number of ſcales. This is its ſtructure in the generality of fiſhes.

This line, in various kinds of fiſh, varies alſo in regard to number, ſituation, figure, and other properties. In regard to number, there is no line obſerved in the ſyngnathi and petromyza, in almoſt all other fiſh, there is one on each ſide; and, finally, in ſome there are as it were two lines on each ſide: an inſtance of this we have in the ammodytæ. In regard to the ſituation, the differences are theſe: 1. In ſome it is near the back, as in the clupea, ſalmons, perch, and the like. 2. In others it is placed nearer the belly, and runs parallel with it, as in the cyprini. 3. In ſome it is placed in the centre of each ſide between the back and the belly, as in the caraſſius. 4. In ſome it is placed againſt the interſtices of the muſcles, or ſpina dorſalis, as in the muræna. And, 5. In ſome it is placed above the interſtices, as in the ammodytæ, &c. It has been ſuppoſed by many, that this *linea lateralis* was always parallel to the interſtices of muſcles; but this is evinced to be an erroneous opinion, by the obſervation of the perch and mackrel. In regard to the differences of figure, this line is in ſome ſtraight, as in the coregone, ſalmons, &c. 2. In others it is crooked, as in the cyprini, the perch, &c. and in the generality of fiſh is ſmooth to the touch, but in ſome it is rough and aculeated, as in the trachurus and pleuronecti. See *Anatomy of* FISHES.

LINE *of the Banquet*, in the *Manege*. See BANQUET.

LINE *of a Volt*. See SQUARE and VOLT.

LINE *of Direction*, in *Mechanics* and *Gunnery*. See DIRECTION.

LINE *of Gravitation of a heavy Body*, is a line drawn through its centre of gravity, and according to which it tends downwards.

LINE *of the ſwifteſt Deſcent of a heavy Body*. See DESCENT and CYCLOID.

LINE *of a Projectile*. See PROJECTILE.

LINES, in *Muſic*. Three, four, five, or ſix horizontal and parallel lines compoſe the ſtaff, upon which and between which all muſic, ſince the invention of counterpoint, has been written.

The ſtaff in canto fermo, or plain ſong, conſiſted only of a ſingle line, drawn through or between the points or dots of different elevation, to aid the prieſts in chanting: then two, three, and, finally, four lines compoſed the ſtaff for Gregorian notes in the miſſals and maſs books, in Roman Catholic churches; and theſe have never been increaſed. Secular muſic for the virginal, ſpinnet, harpſichord, and organ, from the time of queen Elizabeth to the end of the ſeventeenth century, was written on a ſtaff of ſix lines, both in the treble and the baſe. At the beginning of the laſt century, all muſic, except the tablature for the lute and guitar, began to be conſtantly written on and between five lines, called *ſpaces*, with the occaſional uſe of ſhort additional lines, for notes that go higher or lower than the regular ſtaff. The lines and ſpaces in all muſic are counted from the bottom, ſo that the loweſt is the firſt, the higheſt in canto fermo the fourth, and in figurative muſic the fifth. See STAVE, STAFF, PORTÉE, and RIGHE.

LINE, in *Inland Navigation*, is often uſed to expreſs the principal part of a canal, and thus to diſtinguiſh it from its branches.

LINES *of Deviation*, denote lines on the parliamentary plans of ſome canals, ſhewing the diſtances within a hill it is intended that the cutting of the canal ſhould be continued.

LINE, *Geometrical*, in *Perſpective*, is a right line drawn in any manner on the geometrical plane.

LINE, *Horizontal*. See HORIZONTAL.

LINE, *Terreſtrial*, or *Fundamental Line*, is a right line, wherein the geometrical plane, and that of the picture, or draught, interſect one another.

Such is the line N I (*Plate* I. *Perſpective*, *fig.* 3.) formed by the interſection of the geometrical plane L M, and the perſpective plane H L.

LINE *of the Front*, is any right line parallel to the terreſtrial line.

LINE, *Vertical*, is the common ſection of the vertical, and of the draught.

LINE, *Viſual*, is the line, or ray, imagined to paſs from the object to the eye.

LINE *of Station*, according to ſome writers, is the common ſection of the vertical and geometrical planes. Others mean by it, the perpendicular height of the eye above the geometrical plane; others, a line drawn on that plane, and perpendicular to the line expreſſing the height of the eye.

LINE, *Objective*, is any line drawn on the geometrical plane, whoſe repreſentation is ſought for in the draught or picture.

LINE *of Diſtance*. See DISTANCE.

LINES *on the plain Scale*, in *Trigonometry*, are the line of chords, line of ſines, line of tangents, line of ſecants, line of ſemi-tangents, line of leagues. The conſtruction and application of theſe lines, ſee under SCALE, SAILING, &c.

LINES *on Gunter's Scale*, are the line of numbers, line of artificial ſines, line of artificial tangents, line of artificial verſed ſines, line of artificial ſines of rhumbs, line of artificial tangents of the meridian line, and line of equal parts. The conſtruction and application of theſe lines, ſee under GUNTER'S *Scale*.

LINES *of the Sector*, are the line of equal parts, or line of lines; line of chords, line of ſines, line of tangents, line of ſecants, line of polygons, line of numbers, line of hours, line of latitudes, line of meridians, line of metals, line of ſolids, line of planes; the conſtruction and uſe of theſe, ſee SECTOR.

LINE, in the *Art of War*, is underſtood of the diſpoſition of an army, ranged in order of battle; with the front extended as far as may be, that the ſeveral corps of cavalry and infantry which compoſe it, may not be cut off or flanked by the enemy.

An army uſually conſiſts of three lines; the *firſt* is the front, van, or advance-guard; the main body forms the *ſecond*, in which is the general's poſt; the *third* is a reſerved body, or rear-guard. The term *line*, as expreſſing a military arrangement for battle, was not known till the 16th century. Before that period, when armies were ranged in order of battle upon three lines, theſe ſeveral lines were denominated in the manner above ſtated: but the terms advance-guard, main body, and rear-guard, are never uſed in modern times, except when an army is on its march: when drawn up for action, or in the field for review, they are denominated *lines*.

The ſecond line ſhould be about three hundred paces behind the firſt, and the reſerve at about five or ſix hundred paces behind the ſecond.

The artillery is likewiſe diſtributed along the front of the firſt line. The front line ſhould be ſtronger than the ſecond, that its ſhock may be more violent, and that, by having a greater front, it may more eaſily cloſe on the enemy's flanks.

Each line is ſo drawn up, that the wings or extremities always conſiſt of ſome ſquadrons of horſe, whoſe intervals are ſupported by infantry platoons. The battalions are poſted in the centre of each line; ſometimes they are intermixed with ſquadrons of horſe, when a conſiderable body of cavalry is attached to the army. The ſpace of ground which in each line ſeparates the different corps from one another, is always equal in extent to the front that is occupied by them. Theſe intervals are left in order to facilitate their ſeveral movements, and to enable them to charge the enemy without confuſion. It is a general rule, that the intervals or ſpaces which are between each battalion and ſquadron belonging to the *ſecond* line ſhould invariably correſpond with the ground that is occupied by the battalions and ſquadrons which conſtitute the *firſt* line; in order that the *firſt* line, on being forced to fall back, may find ſufficient ſpace to rally, and not endanger the diſpoſition of the *ſecond* line, by precipitately thronging and preſſing upon it. Each line is divided into right and left wings; each wing is compoſed of one or more diviſions: each diviſion is compoſed of one or more brigades; and each brigade is formed of two, three, or four battalions. Battalions are formed in line at a diſtance of twelve paces from each other, and this interval is occupied by two cannon, which are attached to each battalion. For the difference between the Pruſſian and French mode of arrangement, and other particulars, ſee ARMY, BATTLE, COLUMN, ENGAGEMENT, and TACTICS.

The LINE is a term frequently uſed to diſtinguiſh the regular army of Great Britain from other eſtabliſhments of a leſs military nature. All numbered, or marching regiments, are called *the line*. The guards are an exception to this rule. The marines, fencible, militia, volunteer, and yeomanry corps, together with the life-guards, are not comprehended under this denomination. The term line, however, has not been applied with ſufficient preciſion and diſcrimination. Strictly ſpeaking, line, in military matters, denotes that ſolid part of an army which is called the main body, and has a regular formation from right to left. Upon the whole, it may be obſerved, that the term is generally miſapplied, and that it cannot, with ſtrict propriety, be uſed to diſtinguiſh any particular eſtabliſhment from another.

LINE, *To*, from the French *aligner*, is to dreſs any given body of men, ſo that every individual part ſhall be ſo diſpoſed as to form collectively a ſtraight continuity of points from centre to flanks.

LINE *of March*, denotes the orderly ſucceſſion of the component parts of an army that is put in motion.

LINES *of March*, are bodies of armed men marching in given points to arrive at any ſtraight alignment on which they are to form. The line is ſaid to be well *dreſſed*, when no part is out of the ſtraight alignment. That this may be effected, at the word *dreſs*, which is given by the commander, it is immediately to commence from the centre of each battalion, the men looking to their own colours, and the correcting officers lining them upon the colours of their next adjoining battalion.

LINE-*firings* are executed ſeparately and independently by each battalion.

LINE *of Fire*. See FIRE.

LINE, *To form the*, is to arrange the troops in order of battle, or battle array.

LINE, *Inverſion of the*, is a manœuvre which is effected by facing a battalion or line to the right about, inſtead of changing its poſition by a countermarch; ſometimes it may be neceſſary to form to a flank with its rear in front. The column, with its line in front, may arrive on the left of its ground, and be obliged immediately to form up and ſupport that point, ſo that the right of the line will become the left. Part of a ſecond line may double round on the extremity of a firſt line, thereby to outflank an enemy. Theſe, and various other movements, may be found neceſſary, and they can only be practiſed with ſafety and expedition by the inverſion of the line.

LINES, *Retiring*, denote bodies of armed men that have advanced againſt an oppoſing enemy in order of battle, withdrawing themſelves with regularity from the immediate ſcene of action. On this occaſion, it is of the greateſt moment, that the line ſhould be correctly dreſſed before it faces to the right about; and the battalions will prepare for the retreat in the manner preſcribed for the ſingle one, by receiving the caution, that "the line will retire."

LINES *of Support*, are lines of attack, which are formed to ſupport one another. If there are ſeveral, the ſecond ſhould outflank the firſt, the third the ſecond, the advanced one being thereby ſtrengthened and ſupported on its outward wing.

To LINE *Men*. Officers and non-commiſſioned officers are ſaid to *line* the men belonging to their ſeveral battalions, diviſions, or companies when they arrive at their dreſſing points, and receive the word *dreſs* from the commander of the whole. When a ſingle battalion halts, it is dreſſed or lined on its right centre company, and muſt, of courſe, be in a ſtraight line. When ſeveral battalions dreſs from the centre of each on its next colour, the general line will be ſtraight, provided all the colours have halted regularly in a line. On theſe occaſions, every thing will depend upon the two centre dreſſes of each battalion.

To LINE *a Coaſt*, under the immediate preſſure of invaſion, requires not only great ability and exertion in the commanding officer of the particular diſtrict againſt which an inſult may be offered, but it is moreover neceſſary, that every individual officer in the different corps ſhould minutely attend to the particular ſpot on which he may be ſtationed. The Engliſh coaſt, eſpecially where there are bays, is almoſt always interſected by narrow paſſes through the rocks or ſand-hills. On this account, when any body of men receives orders to line a ſpecified extent of ground, the officers who are entruſted with the ſeveral parts of a battalion or brigade, ſhould take care to make the moſt of their men, and to extend their files in ſuch a manner, as not only to preſent an impoſing front from the crown of the hill, but to be able, at a moment's warning, to carry their whole ſtrength to prevent the enemy from getting upon the flanks by ſuddenly ruſhing up the gap. Much coolneſs is required on theſe occaſions.

To LINE *Hedges, &c.* to plant troops, artillery, or ſmall arms, along them under their cover, to fire upon an enemy that advances openly, or to defend them from the horſe, &c.

To LINE *a Street or Road*, is to draw up any number of men on each ſide of the ſtreet or road, and to face them inwards. This is frequently practiſed on days of ceremony, when ſome diſtinguiſhed perſon is received with military honours on his way through places where troops are ſtationed.

LINE, *To break the*, is to change the direction from that of a ſtraight line, in order to obtain a croſs-fire.

LINE, *Turning out of the*. The line turns out without arms whenever the general commanding in chief comes along the front of the camp. When the line turns out, the private men are drawn up in a line with the bells-of-arms; the corporals on the right and left of their reſpective companies; the picquet forms behind the colours, with their accoutrements on, but without arms. The ſerjeants draw up one pace in the front of the men, dividing themſelves equally. The officers draw up in ranks according to their commiſſions, in the front of the colours; two enſigns taking hold of the colours. The field-officers advance before the captains. The camp-colours on the flanks of the parade are to be ſtruck, and planted oppoſite to the bells-of-arms; the officers' ſpontoons are to be placed between the colours, and the drums piled up behind them; the halberts are to be planted between and on each ſide the bells-of-arms, and the hatchets turned from the colours.

LINE, or *Line of Battle*, in *Naval Tactics*, is applied to the diſpoſition of a fleet on the day of engagement; on which occaſion the veſſels are uſually drawn up as much as poſſible, in a ſtraight line, as well to gain and keep the advantage of the wind, as to run the ſame board. See ENGAGEMENT.

This right line, or long file, is prolonged from the keel of the hindmoſt to that of the foremoſt, and paſſes longitudinally through the keels of all the others, from the van to the rear; ſo that they are, according to the ſea-phraſe, in the wake of each other. In the line, or order of battle, all the ſhips of which it is compoſed are cloſe hauled, upon the ſtarboard or larboard tack, about fifty fathoms diſtant from each other. When a fleet is drawn up in line, in preſence of an enemy, it ſhould be formed in ſuch a manner as that the ſhips may mutually ſuſtain and reinforce each other, and yet preſerve a ſufficient ſpace in their ſtations, to work or direct their movements with facility during the action. The line cloſe-hauled is peculiarly choſen as the order of battle, becauſe, if the fleet, which is to windward, were arranged in any other line, the enemy might ſoon gain the weather-gage of it; and even if he thinks it expedient to decline that advantage, it will yet be in his power to determine the diſtance between the adverſe fleets in an engagement, and to compel the other to action. The fleet to leeward, being in a line cloſe-hauled, parallel to the enemy, can more readily avail itſelf of a change of the wind, or of the neglect of its adverſary, ſo as to get to windward of him; or, at leaſt, ſo as to avoid coming to action, if the enemy is much ſuperior, or to prevent him from eſcaping, if he ſhould attempt it. Beſides, in this order, the ſails of yarn. (9 Geo. II. c. 4.) By 14 Geo. III. c. 72. it is enacted that no greater duty ſhall be paid for ſtuffs made of raw cotton wool within this kingdom than 3½*d*. a yard, 43 Geo. III. c. 69. and that any perſon may uſe the ſame in apparel or otherwiſe: and every piece is to have three blue ſtripes in both ſelvedges, and to be ſtamped at each end with a ſtamp provided by the officers of exciſe, and inſtead of the word *calico*, uſed for foreign calicoes, each piece ſhall be marked with the words *Britiſh Manufactory*. If ſtuffs made wholly of cotton, and printed, painted, ſtained, or dyed ſtuffs, (muſlins, neckcloths, and fuſtians excepted,) without ſuch mark ſhall be expoſed to ſale, they ſhall be forfeited, and 50*l*. for each piece. If any perſon ſhall counterfeit ſuch ſtamp, or knowingly ſell ſuch ſtuffs with a counterfeit ſtamp, he ſhall be guilty of felony without benefit of clergy. If any perſon ſhall import any calicoes, muſlins, or other ſtuffs made of linen yarn only, or of linen yarn and cotton wool mixed, or wholly of cotton wool, in which ſhall be wove in the ſelvedge any ſuch blue ſtripe, he ſhall forfeit the ſame, and 10*l*. for each piece. Every ſuch printer, painter, ſtainer, or dyer, ſhall give notice in writing, at the next office, of his name and place of abode, and where he intends to work, on pain of 50*l*. (10 Anne, c. 19. 25 Geo. III. c. 72.) By 1 Geo. ſt. 2. c. 34. any perſon, undertaking to print, paint, &c. any ſilks, linens, or ſtuffs, at any other place than the place of his uſual reſidence or exerciſe of his trade, ſhall firſt make entry of the place, and pay the duties, on pain of 50*l*., and forfeiture of the goods. Officers may enter at all times by day or night to take account, &c. and the penalty of obſtructing the officer in the execution of his duty is 200*l*. (10 Anne, c. 19. 25 Geo. III. c. 72.) Goods ſhall be entered once in ſix weeks on oath before the collector or ſuperviſor, on pain of 50*l*. (10 Anne, c. 19.) No perſon ſhall begin to print, ſtain, paint, or dye any goods before they have been meaſured and marked, on pain of forfeiting the ſame, and alſo 20*l*. for every piece. (25 Geo. III. c. 72.) If any printer ſhall wilfully cut out or deface ſuch frame mark, he ſhall forfeit 50*l*. Concealing goods, or avoiding duty, incurs a forfeiture of 50*l*.: and all goods found in a place, of which no notice has been given, or the value thereof, ſhall be forfeited. (10 Anne, c. 19. 25 Geo. III. c. 72.) Nor ſhall goods be kept in unentered places on pain of forfeiting 50*l*. and the goods. 20 Geo. III. c. 72.) Within ſix weeks the duties ſhall be cleared, on pain of forfeiting double. (10 Anne, c. 19.) Nor ſhall they be removed before the officer hath taken account of them and ſtamped them, on pain of 50*l*. and ſeizure. (10 Anne, c. 19. 25 Geo. III. c. 72.) Goods ſurveyed ſhall be kept ſeparate from thoſe unſurveyed, on pain of 50*l*.: and goods unſtamped may be ſearched for and ſeized. (10 Anne, c. 19. 25 Geo. III. c. 72.) The perſon in whoſe cuſtody ſuch goods are found ſhall forfeit 100*l*. 5 Geo. c. 11. 27 Geo. III. c. 31.

Calicoes, &c. that ſhall not have three blue threads in the ſelvedge, ſhall be deemed foreign calicoes, and on being printed or dyed, ſhall be marked at each end with the words "foreign calicoes for exportation;" and every dealer who ſhall have any ſuch goods in his cuſtody (except dyed throughout of one colour) or any ſtuffs made wholly of cotton wool wove in Great Britain, commonly called "Britiſh Manufactory," (muſlins, neckcloths, and fuſtians excepted,) not having ſuch blue threads, ſhall forfeit 200*l*. and every ſuch piece found in his cuſtody. (25 Geo. III. c. 72.) The owner or printer of any piece or remnant of coſſac or foreign muſlins and calicoes ſhall, before they be preſented to the officer, mark the ſame at both ends with a frame mark, containing his name and place of abode, and alſo the name by which ſuch goods are commonly known (except ſuch as are dyed throughout of one colour) on pain of forfeiting 10*l*. for every piece or remnant. The owner or printer of any linens or ſtuffs made of cotton mixed, or wholly of cotton wool wove in Great Britain, called "Britiſh Manufactory or Muſlins," ſhall mark the ſame at both ends (fuſtians, velvets, velverets, dimities, and other figured ſtuffs excepted) with a mark, containing his name and place of abode, and the name and quality of ſuch goods, with the ready money price thereof, before the ſame are preſented to the officer in order to be printed or dyed; on pain of forfeiture and ſeizure, and 20*l*.; and if any ſuch piece be marked at a leſs price than the real value, the ſame may be ſeized and forfeited, and the owner ſhall forfeit 20*l*. If the frame mark be defaced, the ſame ſhall be renewed on notice; but if any perſon ſhall counterfeit or forge any frame mark, he ſhall forfeit 100*l*.: and if any perſon counterfeit the ſtamp, it is felony without benefit of clergy. (25 Geo. III. c. 72. 27 Geo. III. c. 31.) If any perſon ſhall knowingly ſell any of the goods with a counterfeit ſtamp, he ſhall forfeit 100*l*. and ſtand two hours in the pillory. (10 Anne, c. 19. 13 Geo. III. c. 56. 25 Geo. III. c. 72.) By 27 Geo. III. c. 31. if any perſon ſhall knowingly ſell any ſuch goods with counterfeit ſtamp, thus intending to defraud his majeſty, he ſhall be guilty of felony without benefit of clergy. Every perſon who hath paid the duties, or bought the goods of any perſon who hath paid the duties, may export the ſame, and ſhall be allowed all the duties in drawback, as ſet forth in 43 Geo. III. c. 69. Sched. C. on conforming to certain preſcribed conditions. (25 Geo. III. c. 72. 25 Geo. III. c. 74.) By the 4 Geo. III. c. 37. which eſtabliſhes the corporation of the Engliſh Linen Company for making cambrics and lawns, it is enacted that the commiſſioners of exciſe, where there ſhall be a manufactory of cambrics or lawns, or of goods known under that denomination, ſhall appoint the ſuperviſor or other officer to ſeal the ſame, for which they ſhall have ſuch fee as the commiſſioners ſhall appoint: the manufacturer to give notice in writing to the officer, of the finiſhing of every piece, before it is taken out of the loom, who ſhall ſeal the ſame at both ends; on pain that ſuch manufacturer, taking the ſame out of the loom without having given ſuch notice, and having the ſame ſealed as aforeſaid, ſhall forfeit 5*l*.; and every ſuch piece ſhall be forfeited, and may be ſeized by any officer of the cuſtoms or exciſe, and the officer, with convenient ſpeed after notice, ſhall mark and alſo number each piece; and make entry in writing, in books to be provided at the expence of the manufacturer, of the number ſet to each piece, the length thereof, and the number of threads in the warp, on pain of 10*l*. If the officer ſhall mark any not made in England, or after the ſame is taken out of the looms, he ſhall forfeit 50*l*. for each piece to him who ſhall ſue, and forfeit his office, and be incapacitated to hold any other office of truſt under the crown. If any perſon ſhall offer to the officer any bribe, he ſhall forfeit 50*l*.; and if he ſhall by bribery, or otherwiſe, prevail upon the officer to commit ſuch offence, he ſhall forfeit 100*l*., and ſtand in the pillory two hours. And the officer ſhall yearly, in the month of June, tranſmit to the commiſſioners an account of all goods which he ſhall have ſtamped, and a copy of the entries made, on pain of diſmiſſion; and he, or his executors, ſhall deliver up the ſeals, on demand from the commiſſioners, on pain of 200*l*. Cambrics and lawns made in England found unſtamped, ſhall be forfeited, and may be ſeized by any officer of the cuſtoms or exciſe, and after condemnation ſhall be ſold; and every perſon who ſhall ſell or expoſe to ſale, or have in his cuſtody

For that purpoſe, any cambrics or lawns made in England, unmarked, ſhall forfeit 200*l.* ſuch goods not to be ſold, or worn in this kingdom, but to be exported, and to be ſold only on condition of exportation. Nor ſhall they be delivered out of the warehouſe until bond be given, to the ſatisfaction of the collector, in double penalty of the goods, that the ſame ſhall be exported, and not relanded. To counterfeit the ſeal appointed by this act, or import any foreign cambrics or lawns having ſuch counterfeit mark thereon, or expoſe the ſame to ſale, knowing the ſtamp thereon to be counterfeited, is felony without benefit of clergy. All goods condemned in purſuance of this act, and all pecuniary forfeitures (not otherwiſe directed) ſhall be ſued for and recovered in any of his majeſty's courts, in the name of the attorney-general, or of ſuch officer as aforeſaid; and applied, after deduction of charges, half to the king, and half to the officer ſeizing, informing, or ſuing, according to the directions of this act. The penalties may be ſued for, levied, and mitigated as by the laws of exciſe, or in the courts at Weſtminſter; and employed half to the king, and half to him that ſhall diſcover, inform, or ſue. (10 Anne, c. 19. 34 Geo. II. c. 40. 25 Geo. III. c. 72.) All utenſils and inſtruments for printing, painting, ſtaining, or dyeing ſuch goods, in cuſtody of the ſaid perſon, or any other, ſhall be liable to all arrears of the duty, and to all penalties concerning the ſame, in like manner as if ſuch perſon was the lawful owner. 10 Anne, c. 19. 25 Geo. III. c. 72. 28 Geo. III. c. 37.

Stealing of linen, fuſtian, cotton goods, &c. from whitening-grounds or drying houſes, to the value of 10*s.* or knowingly buying or receiving ſuch ſtolen goods, is felony without benefit of clergy. (18 Geo. II. cap. 27.) Such alſo is breaking into houſes, ſhops, &c. and deſtroying any linen cloth, or implements uſed in the manufacturing of it, by 4 Geo. III. cap. 37. See LARCENY.

A new manufacture was ſet on foot ſome time ago in London, for embelliſhing linen with flowers and other ornaments of gold leaf. The linen looks whiter than moſt of the printed linens; the gold is extremely beautiful, and is ſaid to bear waſhing well. See STUFF.

There are many ſubſtances from which a juice or dye is obtained, that will ſtain linen of different colours. The juice of the anacardium, rubbed on linen or cotton, gives a reddiſh-brown ſtain, which ſoon deepens in the air into a black, and which has not been diſcharged by waſhing and boiling, with ſoap or alkaline ley. Hence the anacardium is ſaid to be uſed for marking linen and cotton cloths, and to be known all over India by the name of marking-nut. The juice of the caſhew-nut, called by ſome the anacardium of the Weſt Indies, differs from the oriental anacardium in its colouring quality; that lodged between its ſhells being much paler, and giving to linen, cotton, or paper, only a browniſh ſtain, which is durable, but does not change at all towards blackneſs.

Several ſpecies of the toxicodendron, or poiſon-wood, contain in their leaves a milky juice, which in drying becomes of a deep black, and communicates the ſame colour to the linen on which it is dropped: the linen thus ſtained, boiled with ſoap, came out without the leaſt diminution of its colour, nor does ſtrong ley of wood-aſhes make any change in it. Phil. Tranſ. vol. xlix. for 1755.

Dr. Lewis has found, that the milks of wild poppies, garden poppies, dandelion, hawk-weed, and ſow-thiſtle, gave brown or browniſh-red ſtains, which were diſcharged by waſhing with ſoap; the colourleſs juice which iſſues from hop-ſtalks when cut, ſtains linen of a pale reddiſh or browniſh-red, extremely durable: the juice of ſloes gave likewiſe a pale browniſh ſtain, which, by repeated waſhings with ſoap, and wetting with ſtrong ſolution of alkaline ſalt, was darkened to a deeper brown; on baking the ſloes, their juice turns red, and the red ſtain which it then imparts to linen is, on waſhing with ſoap, changed to a pale blueiſh, which alſo proves durable. See DYEING *of Thread.*

The late Dr. Smellie has recommended the following method of marking linen, ſo as not to waſh out again: take vermilion, as much as will lie on a half-crown piece, of the ſalt of ſteel a piece about the ſize of a ſmall nutmeg; grind or levigate them well together with linſeed oil: the compoſition may be diluted or thickened at pleaſure.

LINEN, *Foſſil.* See AMIANTHUS and ASBESTOS.

LINEN *Mills.* See MILL.

LINEN, *White.* See WHITE.

LINEN, *Bleaching of.* See BLEACHING.

LIN-FOU, in *Geography*, a town of Corea; 20 miles S. of Haimen.

LING, in *Agriculture*, a provincial term applied to the plant uſually known by the name of heath. See HEATH.

By 4 & 5 W. c. 23. no perſon ſhall on any mountains, hills, heaths, moors, foreſts or chaſes, or other waſtes, burn between February 2, and June 24, any grig, ling, heath, furze, goſs or fern, on pain of being committed to the houſe of correction, for any time not exceeding one month, nor leſs than 10 days, then to be whipped and kept to hard labour.

LING, in *Ichthyology*, the Engliſh name for a kind of fiſh, which is a ſpecies of the gadus, with two fins on the back, with a bearded mouth, and with the upper jaw longeſt. See GADUS *Molva.*

Ling is eſteemed, both freſh and cured, for the table.

This fiſh abounds about the Scilly iſles, on the coaſts of Scarborough, and thoſe of Scotland and Ireland, and forms a conſiderable article of commerce. In the Yorkſhire ſeas they are in perfection from the beginning of February to the beginning of May, and ſome till the end of that month. They ſpawn in June, at which time the males ſeparate from the females. When the ling is in ſeaſon, its liver is very white, and abounds with a fine flavoured oil, which afterwards becomes red, like that of a bullock, and affords no oil. This oil is ſaid to be hoarded up in the cellular membranes of fiſhes, to return into their blood, and ſupport them in the engendering ſeaſon. Great quantities of this fiſh are ſalted for exportation, and for home-conſumption: for this purpoſe it muſt meaſure twenty-ſix inches or upwards from the ſhoulder to the tail, in order to be entitled to the bounty on exportation. Thoſe under that ſize are called *drizzles.* Pennant.

LINGA, in *Geography*, one of the ſmaller Shetland iſlands, near the N. coaſt of Mainland. N. lat. 60° 44′. W. long. 1° 27′.—Alſo, one of the ſame group of iſlands near the E. coaſt of Mainland. N. lat. 60° 34′. W. long. 1° 6′.—Alſo, one of the ſame cluſter, near the S.W. coaſt of Uiſt. N. lat. 61° 2′. W. long. 1° 12′.—Alſo, one of the ſmall weſtern iſlands of Scotland, near the S. coaſt of South Uiſt. N. lat. 57° 3′. W. long. 7° 19′.

LINGA *Sound*, a bay on the W. coaſt of the iſland of Stronſa. N. lat. 59°. E. long. 0° 28′.

LINGA, or *Lingam*, as it is pronounced in the ſouthern and eaſtern parts of the peninſula, in *Hindoo Mythology*, is a ſymbol to which great veneration is paid, and much myſticiſm attached, by the extenſive ſect of Hindoos called Saivas, or the worſhippers of Siva, the deſtructive, or rather regenerative power of their triad. This type of Siva is repreſented of a conical form, and is ſeen in almoſt all parts of India, of various ſizes, in ſtone, wood, clay, metals, &c.

It may be ſuppoſed that Siva, being, among his other attributes, a perſonification of fire, as the moſt deſtructive of elements, was typified by a cone with its apex upwards, the form naturally aſſumed by flame; and that to this form enthuſiaſts have, in the wildneſs of their imagination, fancied alluſions, and directed analogies, that, in the progreſs of time, have more and more bewildered them; until at length ſuch an inextricable maſs of myſticiſm hath been accumulated referring to this ſymbol, as to wear an appearance almoſt of ridicule. The Linga being the ſymbol of Siva, his votaries are reminded of it, and of its archetype by any thing conical or erect; a hill, a tree, any pyramidal object, a maſt or pole, &c. Lingas are ſeen of enormous ſize; in the cavern of Elephanta for inſtance, marking unequivocally that the ſymbol in queſtion is at any rate as ancient as that temple, as they are of the ſame rock as the temple itſelf; both, as well as the floor, roof, pillars, pilaſtres, and its numerous ſculptured figures, having been once one undiſtinguiſhed maſs of granite, which excavated, chiſſelled, and poliſhed, produced the fire cavern, and forms that are ſtill contemplated with ſo much ſurprize and admiration. The magnitude of the cones, too, farther preclude the idea of ſubſequent introduction, and together with gigantic ſtatues of Siva and his conſort, more frequent and more coloſſal than thoſe of any other deity, neceſſarily, as before noticed, coeval with the excavation, indicate his paramount adoration, and the antiquity of his ſect. (See ELEPHANTA and KARLY.) Lingas are ſeen alſo of diminutive ſize for domeſtic adoration, or for perſonal uſe; ſome individuals always carrying one about with them, and in ſome Brahman families one is daily conſtructed in clay, placed, after due ſanctification by appropriate ceremonies and prayers, in the domeſtic ſhrine, or under a tree or ſhrub ſacred to Siva, the Bilva (Cratæva marmelos) more eſpecially, and honoured by the adoration of the females of the houſhold. This ceremony is called Linga-puja, *i. e.* the worſhip of the Linga, a beautiful plate of which, with a particular deſcription, is given in Moor's Hindu Pantheon, where "a pious female is repreſented in plate 22, propitiating Mahadeva (another name of Siva) in his generative character, indicated by the Linga, inſerted in its appropriate receptacle the Argha, or Yoni, myſterious types of nature, particularly diſcuſſed in future pages. The devout female may be imagined as invoking the deities, typified by their ſymbols, for the bleſſing of fruitfulneſs, its reverſe being deprecated by both ſexes, as the moſt afflicting viſitation of divine diſpleaſure. It is explained hereafter, how certain ceremonies called Sradha, to be performed by the offspring of defunct parents, are eſſential to the repoſe of a departed ſoul." P. 68. See SRADHA, YONI, and MERU.

A ſect of Hindoos worſhip almoſt excluſively the Linga, as the ſymbol of their deity: this ſect is called *Lingaja*, *Lingancita*, and *Lingi*. Another ſect, excluſive worſhippers of the *Yoni*, or the female power, are called Yonija; the former being apparently the ſame as the Phallic emblem of the Greeks, the *membrum virile*; and the latter *pudendum muliebre*, rarely, however, ſeen in India in an indecent form. "The myſtery in which the real hiſtory of theſe emblems is veiled, renders it extremely difficult to give a clear account of the origin or tendency of the rites by which we ſee their votaries honour them. That they had their origin in nature and innocence we may admit, without admitting likewiſe the propriety of their continuance to a period when nature and innocence are no longer ſeen unſophiſticated: knowing, however, ſo little of the genuine hiſtory of theſe rites and ſymbols, it is but a reaſonable extenſion of charity to ſuppoſe that their origin was philoſophical though myſterious, and that their obſervance, though offenſive to delicacy, is not criminal.

"It is ſome comparative and negative praiſe to the Hindoos, that the emblems under which they exhibit the elements and operations of nature, are not externally indecorous. Unlike the abominable realities of Egypt and Greece, we ſee the Phallic emblem in the Hindoo exhibitions without offence; and know not, until the information be extorted, that we are contemplating a ſymbol, whoſe prototype is obſcene. The plates of this work may be turned and examined over and over, and the uninformed obſerver will not be aware that in ſeveral of them he has viewed the typical repreſentation of the generative organs or powers of humanity. The external decency of the ſymbols, and the difficulty with which their recondite alluſions are diſcovered, both offer evidence favourable to the moral delicacy of the Hindoo character. I am not, however, prepared to deny the appearance, in many inſtances, of ſtrong evidence to the contrary; the diſguſting faithfulneſs of natural delineations, and the combinations ſo degrading to human nature, obſervable on ſome of the temples and ſacred equipages of the Hindoos, are deeply offenſive to common delicacy and decency; and I continue of opinion that ſuch objects of depravity, publicly offered to juvenile contemplation, cannot fail of exciting in ſuch untutored, eſpecially female, minds, ideas obnoxious to the innocence that we love to think an inmate there." (Hin. Pan. p. 382.) Something on this topic, and an inſtance of the adoration of the Linga in a magnificent temple, occur under the articles IDOLATRY and JEJURY. See alſo PHALLUS. The ſimilarity of Phallic and of Linga worſhip, and other Grecian, Egyptian, and Hindoo coincidences, are learnedly diſcuſſed by major Wilford in the third, fourth, ſixth, and eighth volumes of the Aſiatic Reſearches. See GENTOOS and LOTOS, in this work.

LINGAJA, a ſect of Hindoos, who adore, it is ſaid, excluſively, the Linga, a ſymbol of Siva. See LINGA, and SECTS *of Hindoos*.

LINGAN, in *Geography*, a river of Ireland, which runs into the Suir; 2 miles below Carrick-upon-Suir.

LINGANCITA, a ſect of Hindoos, the ſame with Lingaja, who excluſively worſhip Siva under the ſymbol of a Linga or Phallus. See LINGA, and SECTS *of Hindoos*.

LINGAPOUR, in *Geography*, a town of Hindooſtan, in Dowlatabad; 15 miles S. of Neermul.

LINGAY, one of the ſmaller weſtern iſlands of Scotland, near the S.W. coaſt of Harris. N. lat. 57° 40'. W. long. 7°.

LING-CHAN, a town of Corea; 76 miles E.N.E. of Han-tcheou.

LINGEN, a city of Weſtphalia, and capital of a county of the ſame name; formerly fortified, but now barely ſurrounded with a ditch, and ſmall. It is the ſeat of the regency of the united counties of Lingen and Tecklenburg, and of the deputations of the war and domain chamber of Minden, and has a Calviniſt, a Lutheran, and a Roman Catholic church. The academical gymnaſium of this place was founded in 1697 by William III., prince of Orange. About a quarter of a mile diſtance from the town, N. of it, is the paſſage over the Embs, called the "Lingen Ferry."—Alſo, a county of Weſtphalia, bounded on the N. by the biſhopric of Munſter, on the E. by the biſhopric of Oſnabruck, on the S. by the county of Tecklenburg, and on the W. by Bentheim. At the peace of Tilſit it was ceded by Pruſſia to Weſtphalia. It has mines of coal and quarries of ſtone. The chief town of the upper diviſion of the county is Lingen, and that of the lower Ibbenbuhren.—Alſo, an iſland in the Eaſt Indian ſea, near the S. coaſt of Malacca, about 100 miles in circumference, and 50 miles from the N.E. coaſt of the iſland of Sumatra. S. lat. 0° 10′. E. long. 104° 40′.

LINGENDES, Claude de, in *Biography*, a French Jeſuit, and one of the moſt celebrated preachers of the period in which he flouriſhed, was born at Moulins in the year 1591. He entered the order when he was ſixteen years of age, and after completing his ſtudies to the ſatisfaction of his ſuperiors, became eminent as an inſtructor in rhetoric and polite literature. His chief talent was ſoon diſcovered by the eloquence of his pulpit diſcourſes, and for ſix and thirty years he attracted crowded audiences by the excellence of his compoſitions, and by his fine elocution. Beſides the labours of the pulpit, he preſided eleven years over the college of his native place, and afterwards filled the poſt of provincial of the order in France. He died in 1660, at the age of ſixty-nine, while he was ſuperior of the Jeſuits' ſeminary at Paris. He was author of a popular work, entitled "Monita quædam ad Vitam bene Ordinandam," which has been frequently reprinted: "Votivum Monumentum ab Urbe Molinenſi, Delphino oblatum;" and of Latin ſermons, entitled "Concionum quadrageſimalium Argumenta," which have been publiſhed in 4to. and 8vo. and which have been tranſlated into the French language, and much read in the original and tranſlation. Gen. Biog.

LINGHOLM, in *Geography*, a ſmall iſland among the Orkneys, near the W. coaſt of Stronſa. N. lat. 50° 59′. E. long. 0° 27′.

LINGI, a ſect of Hindoos, worſhippers of the Linga, a Phallic emblem of Siva, the deſtructive and regenerative power of the Indian triad. See Linga, Sects *of Hindoos*, and Siva.

LINGICOTTA, in *Geography*, a town of Africa, in Kullo. N. lat. 12° 30′. W. long. 9° 10′.

LINGLEBACH, John, in *Biography*, a painter of groteſque ſubjects, fairs, mountebanks, landſcapes, &c.; born at Frankfort on the Maine in 1625; who having early acquired ſome knowledge of the art of painting, went to Rome for his improvement, but returned to his native country at the age of 25, to practiſe in his own native ſtyle. He did indeed acquire in Italy a ſlight taſte for the claſſic, which he exhibited by introducing ſplendid ruins ſometimes in his landſcapes; but in general his taſte is Dutch, and his ſtyle alſo, particularly in colouring and effect. His pictures are in general pleaſing, having very much the tone of thoſe of Adrian Vandevelt, though not finiſhed ſo minutely, and indeed differing in choice of ſubject. He was frequently employed by eminent artiſts to inſert figures and animals in their landſcapes; and his ingenuity in the management of his pencil, enabled him ſo to aſſimilate his touch to that of the painter who employed him, that it is not eaſy to diſcover his hand. He died in 1687, at the age of 62.

LING-NGAN, in *Geography*, a city of China, of the firſt rank, in Yun-nan. N. lat. 23° 38′. E. long. 102° 42′.

LINGNIANY, a town of Lithuania; 32 miles E. of Wilkomerz.

LINGONES, in *Ancient Geography*, a people of Gallia Ciſalpina, near the Po, and north of the Boii, in the northern part of Bologneſe and in Ferrara. They formed leagues of amity with the Boii, and, like them, they were Gauls in their origin; and their deſcent has been traced by ſome authors from the Lingones of Gallia Tranſalpina, where they inhabited a territory near the preſent Langres. Their towns in Italy were Forum Cornelii, Claterna, Faventia, Solonæ, and Butrium. Traces of the ſame people have been alſo diſcovered in Upper Germany.

LING-QUAN-Y, in *Geography*, a town of China, in the province of Chen-ſi; 50 miles S.W. of Si-ngan.

LING-TAO, a town of China, of the firſt rank, in Chen-ſi, ſituated on the Tie-tſan river, which falls into the Hoang-ho, or Yellow river. Gold is found in great quantities in the ſand of the neighbouring rivers and brooks. The country is very mountainous, and abounds with wild bulls, and an animal reſembling a tyger, whoſe ſkins are very valuable. The vallies are fertile in corn, and the paſtures near the rivers ſupply food for cattle. Upon this city depend two cities of the ſecond claſs, and three of the third. N. lat. 25° 22′. E. long. 106° 34′.

LING-TCHEOU, a town of Corea; 28 miles S.S.W. of Koang-tcheou.

LINGUA Groſſa, a town of Sicily, in the valley of Demona; 9 miles W. of Taormina.

Lingua, *Tongue*, in *Anatomy*. See Deglutition and Tongue.

Lingua *Avis*, *Bird's-tongue*, in the *Materia Medica*, the ſeed of the aſh-tree, or aſhen-keys.

Lingua *Cervina*, in *Botany*, Hart's Tongue, a ſpecies, or with Plumier, Tournefort, and others, a genus of the fern tribe. See Asplenium and Scolopendrium.

Lingua *Medietas*, in *Law*. See Medietas.

LINGUÆ Frænum, in *Anatomy* and *Surgery*. See Frænum.

LINGUADO, in *Ichthyology*, the name of a Weſt Indian fiſh, in ſhape reſembling a ſoal.

LINGUALIS, in *Anatomy*, an epithet applied to ſome parts about the tongue. The lingual artery is a large branch of the external carotid. (See Artery.) For the lingual glands, ſee Deglutition; for the lingualis muſcle, ſee Deglutition; and for the lingual nerve, ſee Nerve.

LINGUATULA, in *Ichthyology*, a ſpecies of *pleuronectes*; which ſee.

Linguatula, in *Natural Hiſtory*, a genus of the vermes molluſca claſs and order: body depreſſed, oblong; mouth placed before, ſurrounded with four paſſages. Of this genus there is but a ſingle ſpecies; *viz.* the *Serrata*, which inhabits the lungs of a hare.

LINGULA, in *Ichthyology*, the name of an extremely ſmall fiſh of the ſoal-kind. It is known from the reſt of this genus not only by its ſmallneſs, but by a ridge of ſmall ſcales, which run along the line over the ſpine, and are much more elevated and diſtinguiſhable, both to the eye and touch, than thoſe of the reſt of the body. It is a well-taſted fiſh, and much firmer in its fleſh than the ſoal, but is very ſcarce, and is of little value, becauſe of its thinneſs. It is caught in the Mediterranean.

LINGULACA, a name by which ſeveral authors, particularly ſome of the older naturaliſts, have called the *ſoal fiſh*.

LINGULATUM Folium, in *Botany*. See Leaf.

LINGUMPILLY, in *Geography*, a town of Hindooſtan, in Myſore; 30 miles S.W. of Tademeri.

LINHARES, a town of Portugal, in the province of Tras los Montes; 19 miles S. of Mirandela.—Alſo, a town of Portugal, in the province of Beira; 5 miles S.W. of Calorico.

LINHAY, in *Rural Economy*, a provincial word applied in Devonſhire to ſignify an open ſhed.

LINIE'RES, La, in *Geography*, a town of France, in the department of the Charente; 15 miles S.W. of Angouleſme.

LINIMENT, Linimentum, from the Latin *linire*, *to anoint gently*, in *Pharmacy*, a form of external medicine, made of unctuous ſubſtances, uſed to rub on any diſtempered part.

The liniment is of a mean conſiſtence between an oil and an unguent.

The uſe of liniments is to ſoften aſperities of the ſkin, moiſten parts that need humectation, and reſolve the humours that afflict the patient and give him pain. There are various kinds of liniments uſed, according to the various occaſions.

LINIMENTUM Album, P. L. 1745; *Unguentum ſpermaceti*, P. L. 1787; *Unguentum cetacei*, P. L. 1809, ointment of ſpermaceti, is formed as follows: take oil-olive three ounces, ſpermaceti ſix drachms, white wax two drachms; melt all together over a gentle fire, ſtirring it till it is perfectly cold.

This liniment may be applied in caſes of excoriation, where, on account of the largeneſs of the ſurface, the ointment with lead or calamine might be improper.

Linimentum *Æruginis*, *Liniment of Verdigris*, P. L. 1809; *Unguentum Ægyptiacum*, P. L. 1720; *Mel Ægyptiacum*, P. L. 1745; *Oxymel æruginis*, P. L. 1787, is prepared by diſſolving an ounce of powdered verdigris in ſeven fluid-ounces of vinegar, and ſtraining it through a linen cloth; then adding gradually fourteen ounces of clarified honey, boil it down to a proper conſiſtence. This preparation is intended only for external uſe.

Linimentum *Ammoniæ Fortius*, *ſtrong liniment of ammonia*, is formed by ſhaking together a fluid-ounce of ſolution of ammonia, with two fluid-ounces of olive oil, until they unite.

Linimentum *Ammoniæ Carbonatis.* See **Linimentum** *Volatile*.

Linimentum *Arcæi*, P. L. 1720; *Unguentum e gummi elemi*, P. L. 1745; *Unguentum elemi compoſitum*, P. L. 1787, is a compoſition formed by melting a pound of elemi with two pounds of prepared ſuet; then removing it from the fire, and immediately mixing in ten ounces of common turpentine, and two fluid-ounces of olive oil; then ſtraining the mixture through a linen cloth. See Elemi.

Linimentum *Camphoræ*, *Camphor liniment*, is prepared by diſſolving half an ounce of camphor in two fluid-ounces of olive oil. This is a ſimple ſolution of camphor in oil, which readily diſſolves it. The ſame ſolution alſo affords an uſeful method of giving camphor internally in a liquid form, by rubbing it in this ſtate firſt with mucilage, and then adding any aqueous vehicle. One drachm of the oil contains, as thus prepared, fifteen grains of camphor. See Camphor.

Linimentum *Camphoræ Compoſitum*, *Compound camphor liniment*, is prepared by mixing ſix fluid-ounces of ſolution of ammonia with a pint of ſpirit of lavender in a glaſs retort; then, by the heat of a ſlow fire, diſtilling a pint; and laſtly in this diſtilled liquor diſſolving two ounces of camphor. See Camphor.

Linimentum *Hydrargyri*, *Mercurial liniment*, conſiſts of the following ingredients; *viz.* ſtrong mercurial ointment and prepared lard, of each four ounces, an ounce of camphor, 15 minims (of which 60 make a fluidrachm) of rectified ſpirit, and four fluid-ounces of ſolution of ammonia. It is prepared by firſt powdering the camphor with the addition of the ſpirit, then rubbing it with the mercurial ointment and the lard, and, laſtly, adding gradually the ſolution of ammonia, and mixing the whole together. This combination requires that the camphor ſhould be powdered by the ſmalleſt poſſible quantity of ſpirit, and if the other ſubſtances be added in the manner above directed, it will form a maſs of uniform conſiſtence without ſeparating; and it will be conſiderably thicker than the other liniments are. It is an uſeful combination for the diſcuſſion of indolent ſwellings or collections of fluid; but if it be frequently or largely applied, it will affect the mouth more rapidly than the mercurial ointment will do.

Linimentum *Saponaceum*, *Linimentum ſaponis compoſitum*, or *compound ſoap-liniment*, a form of medicine preſcribed in the London Pharmacopeia, and meant to ſupply the place of the ointment well known by the name of *opodeldoc*. It is made thus: take ſpirit of roſemary a pint, hard Spaniſh ſoap three ounces, camphor one ounce; diſſolve the camphor with the roſemary ſpirit, and then add the ſoap; and macerate in the heat of a ſand-bath until it be melted.

A liniment of this kind may be prepared by rubbing an ounce of camphor, with two ounces of Florence oil, in a mortar, till the camphor be diſſolved. This anti-ſpaſmodic liniment may be uſed in obſtinate rheumatiſms, and in ſome other caſes, accompanied with extreme pain and tenſion of the parts.

Linimentum *Terebinthinæ*, *Turpentine liniment*, is formed by adding half a pint of oil of turpentine to a pound of reſin cerate previouſly melted, and mixing. This liniment is very commonly applied to burns; and its firſt introduction into practice for this purpoſe is owing to Mr. Kentiſh of Newcaſtle.

Linimentum *Volatile*, P. L. 1745; *Linimentum ammoniæ*, P. L. 1787; *Linimentum ammoniæ carbonatis*, *liniment of carbonate of ammonia*, is formed by ſhaking together a fluid-ounce of ſolution of carbonate of ammonia with three fluid-ounces of olive-oil, until they unite. Or this liniment may be prepared by ſhaking together an ounce of Florence oil, and half an ounce of ſpirit of hartſhorn. If the patient's ſkin is able to bear it, the liniment, made with equal parts of the ſpirit and oil, will be more efficacious. Sir John Pringle obſerves, that in the inflammatory quinſey, a piece of flannel moiſtened with the liniment and applied to the throat, to be renewed every four or five hours, is one of the moſt efficacious remedies; and that it ſeldom fails, after bleeding, either to leſſen or carry off the complaint.

A liniment for burns may be made by ſhaking well together, in a wide-mouthed bottle, equal parts of Florence oil, or of freſh drawn linſeed oil, and lime-water. This is found to be an exceeding proper application for recent ſcalds or burns. It may either be ſpread upon a cloth, or the parts affected may be anointed with it twice or thrice a day.

A liniment for the piles may be made by mixing two ounces of emollient ointment, and half an ounce of liquid laudanum, with the yolk of an egg, and working them well together.

LINING, in *Canal-Making*, ſignifies a thickneſs or coat of puddle, ſometimes applied to the bottoms and ſides of canals, to prevent them from leaking, as *q r s t*, *Plate* I. *Canals*, *fig.* 15.

Lining *of Hot-beds*, in *Gardening*, is the art or practice of applying a proper layer of hot dung to the ſides of the beds, to revive and keep up the declining heat of them. It is eſſentially neceſſary, in the culture of plants on dung hot-beds, in the early ſeaſons in winter or ſpring, until May. As theſe hot-beds generally, in from three or four to five or ſix weeks, according to their ſubſtance, begin to decline in their degree of heat, they require of courſe a revival to continue them in regular heat; which, in dung hot-beds, can only be effected in this manner. It is applied to one or both ſides, as there may be occaſion, or as heat may be wanted.

Hence in this way, by the occaſional repetition of two, three, or more linings, a hot-bed may be continued in a proper degree of heat ſeveral months, as exemplified in early cucumber and melon hot-beds; which, without the aid of occaſional linings, would not retain ſufficient heat to forward their reſpective plants, &c. to proper perfection.

The dung for this purpoſe ſhould be of the beſt freſh horſe ſtable kind, moiſt and full of a ſteamy lively heat, being prepared in the manner deſcribed under HOT-*Bed*, and in proper quantity to make the lining ſubſtantial, as 15 or 18 inches wide, and as high as the dung of the hot-bed; as, when too ſlender, they do not effect the intended purpoſe, eſpecially in early beds, or when the heat is conſiderably decreaſed.

And in early hot-bed work, care ſhould be taken, according to the extent of the bed or beds and ſeaſon of the year, to allot and reſerve a ſufficiency of dung for linings: early beds in very cold weather will generally require more ſubſtantial and frequent linings than later made beds in the advanced ſpring months; and ſome hot-beds, for ſlight or temporary uſes, juſt to raiſe plants for two or three weeks, will ſometimes require but very little or no linings. Hot-beds made late, as in the beginning or any time in May, will need but very trifling linings, or ſome not at all, except in particular uſes, as when plants are rather backward in growth, the weather cold, and the bed declined much in heat, when, probably, even in May, or beginning of June, a final moderate lining may become neceſſary.

It is neceſſary that the requiſite linings ſhould always be applied to the reſpective hot-beds in proper time, which may be aſcertained by examining the ſtate of heat; not letting them decline too conſiderably before they are applied, but to continue always a moderately lively heat, but never violent. Linings are ſometimes applied by degrees, raiſing them only half-way at firſt; adding more in height in a few days, and thus proceeding till they are raiſed to the height of the hot-beds.

And in application of linings, it is generally neceſſary to line only one ſide at a time, commonly the back part of the bed firſt; and in a week or fortnight after, to line the front ſide, and both ends, if neceſſary; or in particular caſes of the hot-bed having ſuddenly declined, or been permitted to decreaſe very conſiderably in heat before applying the lining, to line both ſides moderately at once, about 12 or 15 inches in width, but only as high as the dung of the bed at firſt; being afterwards a little augmented by degrees, according as the dung of the lining ſettles.

The general requiſite thickneſs or ſubſtance of the linings is from 12 to 15 or 18 inches width in dung, and as high as the dung of the bed, or ſometimes a few inches higher: but for early beds of cucumbers, melons, or other plants of long continuance in hot-beds, they ſhould generally be laid from 15 to 18 inches in width at bottom, as conceived neceſſary, narrowing the width gradually upwards to 8, 10, or 12 inches at top, which may be raiſed at once to the full height of the dung of the bed, or a few inches higher up the ſide of the frame, to allow for ſettling: but with a ſtrong lining, great caution ſhould be uſed in raiſing it much above the dung of the hot-bed, eſpecially when made of very ſtrong, hot, ſteamy dung, for fear either of its throwing in a too ſtrong heat above to burn the internal earth of the bed, or imparting a copious rank ſteam to penetrate within the frame, which would ſteam-ſcald the tender plants which may be contained therein.

As ſoon as the linings are raiſed to the intended height, it is proper in general to lay a ſtratum of earth at top two inches thick, cloſe up to the bed or bottom part of the frame, ſloping a little outward to throw off the falling wet of rain, ſnow, &c.; which top-covering of earth is eſſential, both to keep the heat of the linings from eſcaping too conſiderably above, in order that it may be directed more effectually to its intended purpoſe of imparting its whole principal heat internally to the revival of that of the bed, and prevent the ſtrong ſteam ariſing immediately from the rank dung from entering the frame at bottom, or through any ſmall crevice, or at top, when the lights are occaſionally raiſed for the admiſſion of freſh air; as the rancid dung ſteam thus produced, without being moderated and corrected by firſt paſſing through a ſtratum of earth, if it ſhould enter within the frame conſiderably, would prove very pernicious to moſt plants, and be the total deſtruction of ſome particular kinds.

And conſtant care muſt be taken, that as the heat of the linings declines to any extent, they muſt, as juſt noticed, be renewed by a ſupply of freſh hot dung. This may ſometimes be effected by turning over, and ſhaking up the ſame dung mixedly together, directly forming it again into a lining: or ſome of the beſt or leaſt decayed or exhauſted parts of the old lining may only be uſed, mixing it up properly with a good ſupply of new dung, applying it immediately in a proper ſubſtantial lining as before. In either of theſe ways, freſh air is entangled, by which a new fermentation and heat is brought on. However, where the dung of the linings is greatly exhauſted, freſh dung ſhould moſtly be uſed in the renewal of the heat.

And linings of hot dung are ſometimes uſed ſubſtantially, in working ſome ſorts of forcing-frames, in raiſing early flowers and fruits, by applying the dung againſt the back of the frame, two or three feet in width at bottom, narrowing gradually to a foot and a half, or leſs, at the top, raiſing the whole according to the height of the frame, from four or five to ſix or ſeven feet; which heating conſiderably againſt the whole back of the frame, communicates the heat internally, by which the different plants are forwarded to early production; ſupporting the internal heat by renewing the linings, as already directed. See FORCING-*Frame*, and *Garden*-FRAME.

Linings of dung are alſo ſometimes uſed in ſupporting the heat of nurſery hot-beds for young pine-apple plants, and ſome other exotics of the hot-houſe or ſtove, both in dung and tan-bark hot-beds, under proper frames and glaſſes; as well as thoſe wintered in theſe detached hot-beds diſtinct from the hot-houſe, &c. in which a conſtant regular heat, almoſt equal to that of the ſtove, muſt be ſupported; ſo that, when the natural heat of the bed is on the decline, a ſtrong lining of hot dung muſt be applied, half a yard or two feet wide below, narrowing moderately upward, and continued on both ſides occaſionally: and as the heat of them ſubſides, it muſt be immediately renewed by a ſupply of freſh dung, either worked up with the beſt of that of the declined dung; or, if this be too much decayed, wholly of new: and thus the hot-beds maintained in a proper degree of heat from the autumn until the ſpring ſeaſon, when they become unneceſſary.

And the decayed dung of the different linings, when done with, becomes excellent manure for the kitchen-garden departments.

LINING, in *Maſt-Making*, denotes the marking of the length, breadth, or depth of any thing, according to deſign, by a cord, rubbed with white or red chalk, faſtened at the extremities, and forcibly pulled up in the middle, or towards one end, then let fall perpendicularly, if meant to be ſtraight, or thrown ſideways to form a curve. Accuracy in the latter performance requires practice.

LININGS, in *Sail-Making*, ſignify the canvas ſewed on the backs and middle of a ſail, to ſtrengthen it.

LINITAN, in *Geography*, a ſmall iſland in the Eaſt

Indian ſea, five miles north from the iſland of Serangan, to which it belongs. S. lat. 5° 36′. E. long. 125° 21′.

LIN-KIANG, a city of China, of the firſt claſs, in the province of Kiang-ſi, ſituated on the banks of the river Yu-ho. Its ſoil is good, and the climate is healthful; but it is ſo much deſerted that the Chineſe ſay, "one hog would be ſufficient to maintain the whole city two days." Four cities of the third claſs belong to its diſtrict. One of its villages is the general mart for all the drugs ſold in the empire; and this circumſtance gives it ſome degree of celebrity. N. lat. 27° 58′. E. long. 115°.

LINKIO, in *Botany*, a kind of water-plant among the Chineſe, the fruit of which is of a triangular pyramidical form, prominent every way, with a green thick rind, that grows reddiſh towards the apex, and, when the fruit is dried, grows black. The internal ſubſtance is exceeding white, its taſte like that of the cheſnut, three or four of which it equals in bulk. The plant is found in ſtanding waters, and has very ſlender leaves, that ſpread themſelves over a large extent on the ſurface of the water, and the fruit lies concealed under water in great numbers.

LINKIOPING, in *Geography*, a ſmall and neat town of Sweden, in Eaſt Gothland, ſituated on the river Stœng, near lake Roxen; containing an epiſcopal palace, a cathedral, and the houſe which is the reſidence of the governor of Eaſt Gothland. It has three churches and a public ſeminary; 96 miles S.W. from Stockholm. N. lat. 58° 26′. E. long. 15° 18′.

LINKNESS, a cape of Scotland, on the N.W. coaſt of the iſland of Stronſa; 1½ mile S.W. of Huipſneſs. N. lat. 59° 4′. E. long. 0° 26′.

LINLEY, John, in *Biography*, an eminent muſic profeſſor and organiſt, long reſident at Bath, where he had ſerved an apprenticeſhip under Chilcot, the organiſt of that city. Linley loved muſic, was a ſtudious man, equally verſed in the theory and practice of his art. Having a large family of children, in whom he found the ſeeds of genius had been planted by nature, and the gift of voice, which, in order to cultivate, he pointed his ſtudies to ſinging, and became the beſt ſinging maſter of his time, if we may judge by the ſpecimens of his ſucceſs in his own family. He was not only a maſterly player on the organ and harpſichord, but a good compoſer, as his elegies and ſeveral compoſitions for Drury-lane theatre evinced. His ſon, Thomas, who was placed under Nardini at Florence, the celebrated diſciple of Tartini, was a fine performer on the violin, with a talent for compoſition; which, if he had lived to develope, would have given longevity to his fame. Being at Grimſthorpe, in Lincolnſhire, at the ſeat of the duke of Ancaſter, where he often amuſed himſelf in rowing, fiſhing, and ſailing in a boat on a piece of water, in a ſquall of wind, or by ſome accident, the boat was overſet, and this amiable and promiſing youth was drowned at an early age, to the great affliction of his family and friends, particularly his matchleſs ſiſter, Mrs. Sheridan, whom this calamity rendered miſerable for a long time; during which, her affection and grief were diſtilled in verſes of the moſt ſweet and affecting kind on the ſorrowful event. The beauty, talents, and mental endowments of this "Sancta Cæcilia rediviva," will be remembered to the laſt hour of all who heard, or even ſaw and converſed with her. The tone of her voice and expreſſive manner of ſinging were as enchanting as her countenance and converſation. In her ſinging, with a mellifluous toned voice, a perfect ſhake and intonation, ſhe was poſſeſſed of the double power of delighting an audience equally in pathetic ſtrains, and ſongs of brilliant execution, which is allowed to very few ſingers. When ſhe had heard the Agujari, and the Danzi, afterwards Madame Le Brun, ſhe aſtoniſhed all hearers by performing their bravura airs, extending the natural compaſs of her voice a fourth above the higheſt note of the harpſichord, before additional keys were in faſhion. Mrs. Sheridan died at Briſtol in 1792.

Mrs. Tickel, her ſiſter, was but little inferior to her in beauty and talents, and Mr. Linley's other daughters continued to excite the admiration of all who knew them, in a manner worthy of the family from which they ſprung.

Mr. Linley, the father of this neſt of nightingales, from being aſſiſtant manager of Drury-lane theatre, lived to become joint patentee, and, for ſome time, ſole acting manager; in which capacity, he gave more ſatisfaction, and eſcaped cenſure, public and private, by his probity and ſteady conduct, more than is often allowed to the governor of ſuch a numerous and froward family. This worthy and ingenious man died November 1795.

LINLITHGOW, in *Geography*, a royal borough and county town of Linlithgowſhire, or Weſt-Lothian, Scotland. It is ſituated on the road between Edinburgh and Stirling, at the diſtance of 16 miles from the metropolis. This town has claims to conſiderable celebrity, both on account of the connection of its hiſtory with ſome of the moſt important tranſactions of the kingdom, and of the noble remains of former magnificence with which it is adorned. As the reader will find mentioned in the following article, the name of this place is purely of Britiſh origin, and peculiarly deſcriptive in its application. During the reign of David I., Linlithgow formed a part of the royal demeſnes, and had a caſtle and a grange, at which that monarch and his ſucceſſors frequently reſided. When Alexander III. died, an event which happened before this town obtained its charter, it was governed by two bailies, as we learn from a writ addreſſed to them by Edward I., dated the 28th of Auguſt 1296, requiring them to make payment of ſome arrears, due to the king of Norway, by the firm of the town. In the year 1298, the ſame monarch encamped his army on the height immediately to the eaſt of Linlithgow on the night before the battle of Falkirk, in which the celebrated patriot, ſir William Wallace, was defeated through the treachery of Cumming. This town was formerly a place of very conſiderable commerce, opulence, and ſplendour, but all theſe advantages began gradually to decay, after the union of the two crowns, in the perſon of James VI. It once had an excluſive right of trade from the water of Cramond to the mouth of the Avon. Blackneſs caſtle was then aſſigned to it as a port, and at this place many warehouſes were erected, ſome of which are ſtill ſtanding. A cuſtom-houſe was likewiſe ſituated here, till removed in the laſt century to Borrowſtowneſs, through the intereſt of the Hamilton family.

The period at which Linlithgow was firſt conſtituted a royal borough by charter is uncertain, but it has doubtleſs exiſted in that capacity from a very early period. In the reign of David I. it is declared by act of parliament one of the principal burghs of the kingdom. Since that time it has received ſeveral charters, all of which were confirmed in 1540 by a writ of *Novodamus* from James V. The government of this town at preſent is veſted in a provoſt, four bailies, a dean of guild, twelve merchant counſellors, and the deacons of the eight incorporated trades. The principal manufacture now carried on is that of leather: ſhoemaking is a thriving buſineſs. The woollen trade is alſo conſiderable, and about a mile from the town there has lately been eſtabliſhed a very extenſive bleach field, which gives employment to nearly 300 perſons.

The preſent condition of Linlithgow, with reſpect to exterior view, is much inferior to what it formerly was.

From the antiquity of many of the houſes, the whole exhibits, at firſt ſight, a ruinous and decayed appearance. There are, however, a number of good buildings ſtill to be found. It conſiſts chiefly of one ſtreet, extending nearly a mile in length, from eaſt to weſt. This is interſected by a variety of ſmaller ſtreets or lanes. The ruins of the palace ſtand on a riſing ground, immediately overlooking the town. They are evidently the remains of a once magnificent and ſuperb manſion. The ſituation of theſe ruins is extremely fine, and ſuch as, in ancient times, would render it well calculated for defence. The eminence on which it is ſituated runs a conſiderable way in an extenſive lake, which conduces greatly to the ornament both of the town and caſtle. The firſt foundation upon this ſpot is ſaid to have been at leaſt coeval with the period of the Gadeni. There ſeems reaſon to believe it was afterwards the ſcite of a Roman ſtation. Fordun ſays that Edward I. erected a *pile* here in 1300. This, however, is doubtful, as it is unqueſtionably true that there was a royal reſidence here before that period, which cannot be ſuppoſed to have been unfortified in thoſe times. It is very probable that this monarch only repaired it for his reception in 1301, previous to paſſing his Chriſtmas in it, which he did that year. During the civil diſſentions between Bruce and Baliol, this caſtle was taken by ſtratagem, through the means of one Binnoch or Binny, who ſecretly favoured the cauſe of Bruce. Binnoch, being accuſtomed to ſupply the fortreſs with hay, was well known, and had free acceſs at all times. Under theſe circumſtances he propoſed to Bruce to conceal ſome armed men in his cart, which ſhould be apparently loaded with hay. Theſe being admitted, ſecured the guards, and made themſelves maſters of the place. For this ſervice Binnoch was rewarded with ſome lands in the neighbourhood. In the reign of Edward III. this caſtle was again ſeized by the Engliſh. In 1424 it was deſtroyed by fire, as well as the greater part of the town. The name of the perſon by whom the former was rebuilt is unknown. It became a fixed royal reſidence ſoon after the acceſſion of the houſe of Stewart to the throne of Scotland; and was ſeveral times aſſigned as a jointure-houſe to the queens of that kingdom. In October 1488, this palace was delivered to the rule of lord Hailes and Alexander Home, two of the principal leaders of the rebellion againſt James III., one of the mildeſt monarchs that ever graced a throne, whoſe melancholy fate every feeling heart muſt pity and bewail. In 1517 it was ſeized by Stirling and his followers, who had attempted to aſſaſſinate Melburne; but was ſoon afterwards retaken by aſſault by De la Baſtie, the regent's lieutenant, when the aſſaſſins were fortunately ſecured. James V. reſided for the moſt part in this palace, during his minority. The battle of Linlithgow was fought on the 4th September 1526, with the view of reſcuing that prince from the domination of the earl of Angus. In this action, the earl of Lennox, the friend of James, was ſlain, after quarter given, by ſir James Hamilton. To the laſt-mentioned monarch and to James VI. this palace was indebted for much of its magnificence and grandeur. Over the inſide of the grand gate there formerly ſtood a ſtatue of pope Julius II. with the triple crown, who ſent a conſecrated ſword and helmet to James V. This piece of ſculpture, after eſcaping for more than a century the fury of the reformiſts, ultimately fell a ſacrifice to the pious zeal of a blackſmith. The whole palace is conſtructed of hewn ſtone, and covers about an acre of ground. It has in the centre a handſome ſquare, one ſide of which is more modern than the others, having been built by James VI. In one portion of this building is a very ſuperb room, 90 feet long, 30 feet 6 inches wide, and 33 high. At one end is a gallery with three arches, probably intended for muſicians. The parliament-chamber, in which the unfortunate queen Mary was born on the 8th December 1542, has likewiſe been an elegant apartment. The whole was kept in good repair till the year 1746, when being uſed as a barrack, a great part of it was accidentally burnt by the king's troops. Since that period it has been ſuffered to fall into ruins. The church of Linlithgow, which is appended to the palace, is a very fine building. Some of the windows are particularly beautiful. In this edifice the aiſle is ſtill ſhewn, in which James IV. is ſaid to have ſeen an apparition, warning him of the impending fate of the battle of Flowden, in which that monarch and the flower of his nobility were ſlain. As there is no doubt but a perſon in an unuſual habit did accoſt that prince, when attending the evening ſervice in this aiſle, it is ſuppoſed to have been a ſtratagem of the queen's, to diſſuade him from his intended enterprize againſt England, which a credulous and ſuperſtitious age converted into a ſupernatural and prophetic admonition. The church is adorned with a handſome ſpire, ſurmounted with an imperial crown. A number of ſtatues formerly decorated the outſide, but were all deſtroyed by the reformers, except that of the patron of the church, the archangel St. Michael. The houſe from which Hamilton ſhot the regent Murray, in the reign of queen Mary, is ſtill ſtanding. This murder is one of the moſt deliberate recorded in the annals of hiſtory. The town-houſe, erected in 1668, is a commodious and elegant ſtructure. In front, but at ſome diſtance from it, there was formerly an antique croſs, ornamented with groteſque figures, and having eight ſpouts at different elevations, from which the water was poured. This having become much decayed, a new one, of ſimilar conſtruction, has lately been erected. Linlithgow anciently poſſeſſed a variety of religious eſtabliſhments. In 1290 the inhabitants founded a convent of Carmelites, or White friars, on an eminence ſouth of the town, ſtill called Friars' Brae. St. Magdalen's on the eaſt, ſituated at the foot of Pilgrim's hill, was formerly a *hoſpitium*, or place of entertainment for ſtrangers. The Dominican or Black friars had likewiſe a monaſtery here. All theſe buildings were demoliſhed by the earl of Argyle, lord James Stewart, and John Knox, when they viſited Linlithgow in their progreſs of reform. Linlithgow rendered itſelf conſpicuous by the part its inhabitants took in the grand rebellion. It had its full ſhare in the miſeries of that diſtracted period. The ſolemn league and covenant was publicly burned here, on the anniverſary of the reſtoration in 1662, by the inhabitants themſelves, without any authority from government. This town ranks as the ſixth among the royal boroughs of Scotland. Since the union, it has been aſſociated with Lanark, Selkirk, and Peebles, in the privilege of ſending one repreſentative to parliament. Winzet, the famous polemical antagoniſt of John Knox, was maſter of the Linlithgow ſchool, when choſen by the Catholic clergy to defend their principles and rights.

The pariſh of Linlithgow is about five miles in length, and three in breadth: it is in general well cultivated and encloſed. Coal is abundant in different parts of it, but no pits are at preſent wrought. There is likewiſe plenty of lime-ſtone, but free-ſtone is ſcarce. Copper-ore has been found in one ſpot; and in the ſouthern extremity there is a ſilver mine, which is ſaid to have been formerly wrought to great advantage. The population of the whole pariſh, according to the parliamentery returns of 1801, amounted to 3594 perſons; the houſes were eſtimated at 746. Sinclair's Statiſtical Account of Scotland.

LINLITHGOWSHIRE, or WEST LOTHIAN, a county on the ſouthern ſhore of the Frith of Forth in Scotland.

land. It is ſeparated from Edinburghſhire on the eaſt and ſouth-eaſt by the rivulets Briech and Amow, except at Midcalder, where the latter county intrudes ſomewhat more than a mile into Linlithgowſhire. On the weſt it is divided from Stirlingſhire, firſt by the Linn-burn, and after its junction with the Avon, by that river, till it diſcharges itſelf into the Forth. A part of Lanarkſhire forms the boundary on the ſouth-weſt, while the waters of the Forth waſh its coaſt for the extent of fourteen miles on the north. The form of this county is that of an irregular triangle. Its medium breadth from north to ſouth is little more than ſeven miles, and its medium length about ſixteen. It contains nearly 112 ſquare miles, or 57,008 Scottiſh acres. The pariſhes amount to 13 in number, compriſing, according to the parliamentary returns of 1800, a population of 17,844 perſons.

The aſpect of this county, except towards the ſouth, where it conſiſts chiefly of moor-moſs and moraſs, is that of a level and well cultivated diſtrict, diverſified by a variety of ſmall hills: theſe are moſt numerous in the middle and weſtern parts of the county. Beginning at Bowden, the more remarkable of them form a range which runs through the centre of the county in an oblique direction from north-weſt to ſouth-eaſt. In the northern diſtrict they are leſs elevated than towards the middle and weſtern parts, and are more variouſly diſtributed. In general they are both uſeful and ornamental, nearly the whole of them affording abundant paſture; many of them being clothed with woods; and not a few of them containing valuable minerals.

Soil and Climate.—This county exhibits a great diverſity of ſoils, as well as variableneſs of climate. Almoſt every kind of clayey ſoil is to be found in different parts of it. About 7000 acres are compoſed of light gravel and ſand, and nearly the ſame extent of that ſpecies which is uſually called loam. The high rocky land extends to about 10,000 acres, and the moſſes to ſomewhat better than 1000. Such parts of this county as border on the Forth, have a temperate and an excellent climate. The upper or ſouth-weſtern part, however, is not ſo much favoured. Its elevated ſituation with the proximity of the moors and moſſes, either in this county or the neighbouring one of Lanark, render it bleak and damp during the greater part of the year.

The lands of this county are poſſeſſed by between thirty and forty landholders whoſe eſtates vary from 200*l.* to 6000*l.* *per annum*, beſides a few of inferior rental. About a third part of the county conſiſts of wood and paſture lands, or is laid down with artificial graſſes. The cauſe of this great proportion of paſture graſs ſeems to be the vicinity of Edinburgh. The agriculture of this county is ſimilar to that of the other Lothians. The upper portions are the pooreſt, but even in the higheſt moors of that diſtrict, art and induſtry are making rapid changes and improvements. The grub-worm is perhaps more deſtructive in this than in moſt other counties. This inſect generally begins its depredations in May or June, eſpecially if the lands have been formerly in graſs, or over-run with moſs, and the crops are ſtunted, which is apt to be the caſe, from the dry eaſt winds which prevail during theſe months. Not above one-ſixth of the whole county remains unincloſed. Great attention is paid to the forming of plantations, particularly in the neighbourhood of gentlemen's ſeats, which tend in no ſmall degree to enrich the ſcenery of this cultivated diſtrict. The ſhores of the Forth are peculiarly ornamented both by nature and art. Barnbeugle park, the ſeat of the earl of Roſeberry, is laid out with plantations, formed in the very beſt taſte, and in a manner well calculated to ſhelter the ſoil, and exhibit the aſpect of the country around to great advantage. On the coaſt, Linlithgowſhire riſes ſuddenly into a ridge adorned by culture and well wooded. From hence weſtward by the ancient ſeat of the Dundas family, and by Hopetoun-houſe, a ſeries of views are to be met with not inferior to any in the kingdom. The ſcenery in the immediate neighbourhood of Queensferry is peculiarly fine, the Forth here forming a narrow ſtrait, which expands ſuddenly on both ſides into an extenſive bay, with richly ornamented banks. At various points of the coaſt the views are different, the water aſſuming the appearance of a lake, a noble river or broad ſea, according to the ſituation from which it is ſeen. In one ſpot, a little diſtance from the ſhore, ſtands Hopetoun-houſe, one of the moſt ſuperb and magnificent ſeats in this kingdom. It is ſituated on a noble and extenſive lawn, ſtretching to the diſtance of more than a mile from the front of the houſe, and forming a ſort of terrace along the banks of the Forth, which winds round it, and preſents the view of a wide extenſive lake, interſperſed with iſlands, and enlivened by a variety of ſhipping. Behind the houſe the ground is more various, breaking into hills, vallies, and promontories, which ſhoot into the Forth. To a conſiderable diſtance the grounds ſeem well wooded and encloſed; the houſe itſelf is flanked with a noble plantation, which ſerves to ſhelter it from the northern blaſts. At the extremities of this vaſt and magnificent ſcenery a variety of mountains ariſe of different forms and at different diſtances. In ſhort, every thing the eye can contemplate in the whole ſcene, or its appendages, is great and noble. The ſituation of the houſe, and its architecture, are alſo equally objects of admiration. It was planned and begun by the celebrated architect ſir William Bruce, and finiſhed by Mr. Adams. Some of the apartments are grand and ſpacious, but they are in general of moderate ſize, which is perhaps the only defect of its contrivance. It abounds with paintings.

With the exception of free-ſtone and coals, there are no minerals of any importance in the county. In the Balligate-hills there was formerly a valuable lead mine, but being now ſought in vain is ſuppoſed to be exhauſted. A free-ſtone quarry, in the neighbourhood of Queensferry, is one of the fineſt in the kingdom. More than three acres have been already excavated. This ſtone is exported in great quantity, both as materials for building, and in the ſhape of grinding-ſtones. Coal abounds in different parts of the county; but is chiefly wrought in the neighbourhood of Borrowſtowneſs. Here is one of the moſt extraordinary coal mines in the world: it extends under the Forth half way acroſs. Formerly there was a building, or moat, about half a mile from the ſhore, where there was an entry down into the pit formed under the ſea. This building being in the ſhape of a quay, veſſels were brought along ſide of it, and loaded with the coals raiſed from the pit and depoſited here. This mine was extremely profitable, but at laſt an unexampled high tide overwhelmed the whole, before the colliers could effect their eſcape. This did not diſcourage the daring adventurers. A new mine was opened, and continues to be wrought at this day to a great extent. For the purpoſe of rendering the coal in the upper parts of this county more extenſively uſeful, it has been propoſed to cut a canal from Glaſgow to Edinburgh, which might likewiſe bring to the eaſtward, at a cheap rate, a portion of the treaſures contained in the hills of Lanarkſhire. To theſe uſeful productions of the mineral deſcription in this county, may be added iron-ſtone, whin-ſtone, grey granite, and ſhell marle. On the ſouth ſide of Dundas-hill is a baſaltic rock, 250 yards in length, and 60 or 70 feet high. The maſſes are in an irregular ſtate, formed like pillars, ſeparated by channels; but not a few of them exhibit regular and well defined priſms. The ſtone of which theſe are compoſed is of a light blueiſh colour.

The royal boroughs in this county are Linlithgow and Queensferry. The former is the ſhire town, and ſituated in the interior of the county. The latter ſtands on the coaſt of the Forth, about nine miles weſt from Edinburgh. It was formerly of more importance than at preſent; it being now totally deſtitute of trade. A particular account of theſe boroughs will be found under their reſpective names.

Borrowſtowneſs, or Bo-neſs, is the principal ſea-port town in this county. It is a borough of barony, governed by a bailiff appointed by the duke of Hamilton. The houſes in this place are low and crowded, and much injured in appearance, by the ſmoke of the numerous ſalt pans with which it abounds. The produce of theſe pans, and of the coal-works in the neighbourhood, are the chief articles of export from this town. The harbour is conſidered very ſafe. About thirty ſail of ſhipping belong to perſons reſident on the ſpot. Many others frequent this harbour in the courſe of trade. The imports are uſually tallow, hemp, timber, flax, and flax-ſeed. The herring-fiſhery is carried on here, but, being hazardous and precarious, ſcarcely deſerves notice in mentioning the commerce of this port. Kineel houſe, belonging to the duke of Hamilton, is beautifully ſituated on the ſhore of the Forth, not far from the town. The village of Bathgate ſtands on the ſouthern declivity of the hills which bear its name, and form a part of the range already mentioned, as running through the centre of the county. Here, as well as in the village of Whitburn, ſituated on the moſt ſouthern road between Edinburgh and Glaſgow, a number of weavers are employed by the Glaſgow manufacturers. At preſent neither of theſe places is of much importance: but in the event of the propoſed canal, formerly noticed, being carried into effect, it is not improbable they would ſoon riſe into conſiderable diſtinction. Beſides theſe, there are few other villages in this county which do not, however, require particular notice.

Among the antiquities of this county is the termination of the celebrated Roman barrier, or wall of Antoninus. It enters Linlithgowſhire near the village of Inner Avon, and proceeds by Kineel houſe to the village of Carriden, behind the church of which, it is probable, the laſt or nineteenth fort, counting from the Clyde, was ſtationed, though no remains of the work can now be diſcovered beyond the incloſures of Grange. Two miles eaſt from Carriden, and one and three quarters weſt from Abercorn, is Blackneſs caſtle, which, from its ſituation with regard to the wall, ſeems not improbably to have been the Roman port on the Forth. In Abercorn pariſh, on a point north-eaſt from the church, Abercorn caſtle was formerly ſituated. It was one of the ſtrong holds of the Douglaſes, and was taken by ſtorm, after a long ſiege, by James II. during his conteſt with that family. After this it was never repaired, and Buchanan mentions it as a ruin in his time. The moſt ancient monaſtery in Scotland was ſituated here, as we learn from the venerable Bede, after whoſe time it is not mentioned in hiſtory. In Torphechen pariſh was a houſe for the knights of St. John; it was founded by king David I. This preceptory was a place of refuge, or ſanctuary. In the church-yard is a ſtone with a St. John's croſs on it, and four ſimilar ones at the diſtance of a mile each. This pariſh is alſo diſtinguiſhed by four great ſtones, ſituated about a mile eaſt of the village, which are ſaid to have been a Druidical temple. In Kirkliſton pariſh is another remarkable ſtone, known to the inhabitants by the name of the *Cat ſtone*. It is four feet and a half high, and eleven feet and a half in circumference. The form is that of an irregular priſm. On one ſide is the following inſcription, rudely, but deeply, cut, the explanation of which has puzzled many antiquaries. "IN OC. TUMVLO JACI UETTA DUICTA." The church of Dalmeny may likewiſe be ranked among the antiquities of this county. Concerning the date of its erection nothing is known. Its architecture is of that middle ſort which has received the appellation of Saxon. It is a ſmall building, apparently with Grecian windows, but upon inveſtigation, the ſhafts are found to be diſproportionate. The eaſtern portion of this church is vaulted with ſemicircular arches, having mouldings chiefly in the form of ſtars and other decorations. Sinclair's Statiſtical Account of Scotland. Chalmer's Caledonia.

LINNÆA, in *Botany*, ſo called in honour of the great Swediſh naturaliſt, (ſee LINNÆUS,) appears by the journal of his Tour to Lapland to have been choſen by himſelf to commemorate his own name, when he gathered it at Lykſele, May 29, 1732. Former botaniſts had called this elegant and ſingular little plant *Campanula ſerpyllifolia*; but Linnæus, proſecuting the ſtudy of vegetables on the only certain principles, the ſtructure of their parts of fructification, ſoon found this to conſtitute a new genus. He reſerved the idea in his own breaſt, till his diſcoveries and publications had entitled him to botanical commemoration, and his friend Gronovius, in due time, undertook to make this genus known to the world. It was publiſhed by Linnæus himſelf in the *Genera Plantarum*, ed. 1, in 1737, and the ſame year in the *Flora Lapponica*, with a plate, being moreover mentioned in the *Critica Botanica*, p. 80, as "a humble, deſpiſed, and neglected Lapland plant, flowering at an early age," like the perſon whoſe name it bears. Linn. Gen. 319. Schreb. 418. Willd. Sp. Pl. v. 3. 340. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 666. Juſſ. 211. Lamarck Illuſtr. t. 536. —Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Aggregatæ*, Linn. *Caprifolia*, Juſſ.

Gen. Ch. *Cal.* Perianth double; that of the fruit inferior, of two or four leaves; the outermoſt of which are oppoſite and minute; the others elliptical, concave, erect, hiſpid, cloſed around the germen, permanent; that of the flower (the proper one) ſuperior, of one leaf, in five erect, narrow, acute, equal, deep ſegments. *Cor.* of one petal, above twice as long as its perianth, bell-ſhaped, its border in five rather deep, obtuſe, nearly equal diviſions. *Stam.* Filaments four, awl-ſhaped, inſerted into the bottom of the corolla, two of them much the ſmalleſt; anthers compreſſed, verſatile. *Piſt.* Germen roundiſh, inferior; ſtyle thread-ſhaped, ſtraight, the length of the corolla, inclining; ſtigma globoſe. *Peric.* Berry dry, ovate, of three cells, clothed with the hiſpid glutinous perianth of the fruit, deciduous. *Seeds* roundiſh, two in each cell.

Eſſ. Ch. Calyx double; that of the fruit of two or four leaves; that of the flower ſuperior, in five deep diviſions. Corolla bell-ſhaped. Berry dry, of three cells.

Obſ. The two outer or ſmaller leaves of the inferior calyx are often wanting. When preſent they are like the inner ones in ſhape, though ſmaller in ſize, and ſtand like them cloſe to the germen, being totally diſtinct from the bracteas, which are a little remote from them, lanceolate and acute.

1. L. *borealis*. Linn Sp. Pl. 880. Fl. Suec. 219. t. 1. Fl. Lapp. ed. 2. 214. t. 12. f. 4. Engl. Bot. t. 433. Fl. Dan. t. 3. (Campanula ſerpyllifolia; Bauh. Prodr. 35.)— Native of dry ſtony moſſy ancient fir woods, in Sweden, Siberia, Ruſſia, Switzerland, Scotland, and North America, flowering in May and June. Linnæus deſcribes it in his Lapland Tour, v. 1. 20, as clothing maſſes of ſtones,

being interwoven with ivy, in a pictureſque manner. It was firſt diſcovered in Britain, June 2d, 1795, by the late profeſſor James Beattie of Aberdeen, in an old fir wood at Mearns in that county.

The *root* is fibrous and perennial. *Stems* trailing, creeping, perennial, woody, round, leafy, ſomewhat hairy, often reddiſh, a little branched, very long and ſlender. *Leaves* evergreen, oppoſite, ſtalked, roundiſh or ovate, veiny, crenate in the fore-part, paler beneath, bearing a few ſcattered hairs on the upper ſide. Flowering *branches* erect, three or four inches high, with a pair or two of leaves near the bottom, naked above, terminating in two equal *flower-ſtalks*, with a pair of ſmall leaves at their origin, and each bearing one drooping *flower*, accompanied by two ſmall, lanceolate, ſlightly remote, oppoſite *bracteas*, which, like the ſtalks, calyx and germen, are clothed with glandular viſcid hairs. The *flowers* are of a delicate pink, eſpecially within, being pale white or yellowiſh externally. They are ſaid in the *Flora Suecica* to be very fragrant at night, ſmelling like Meadow-ſweet. An infuſion of the leaves, with milk, is eſteemed a ſpecific, among the Swedes, in rheumatic and ſciatic diſorders. The inhabitants of Weſt Bothnia cure painful complaints in the feet of their ſheep, with a cataplaſm or fomentation made of this herb. The ſmoke of it when burnt is thought by the Norwegians beneficial in the ſcarlet fever; and its decoction in the itch.

This is the only known ſpecies of *Linnæa*. The right honourable ſir Joſeph Banks is poſſeſſed of a drawing, made by an artiſt who was employed many years ago to delineate plants in the Eaſt Indies, which repreſents a plant anſwering to the ſame generic characters, but of which no ſpecimens having ever been ſeen, the drawing is ſuppoſed to be a forgery. The younger Linnæus, when in England, was much intereſted by the ſight of it, but endeavoured in vain to aſcertain its truth.

LINNÆAN *Syſtem of Botany*. See BOTANY, FLOWERS, and SEXUAL *Syſtem*.

LINNÆUS, CHARLES, afterwards VON LINNÉ, in *Biography*, the moſt eminent of modern naturaliſts, whoſe labours and abilities rendered his favourite ſcience of Botany firſt more philoſophical, and then more popular, than it had ever been in any other age, was born at Råſhult, in the province of Smaland, in Sweden, May 13th, old ſtyle, 1707. His father Nicholas Linnæus was aſſiſtant miniſter of the pariſh of Stenbrohult, to which the hamlet of Råſhult belongs, and became in proceſs of time its paſtor or rector; having married Chriſtina Broderſon, the daughter of his predeceſſor. The ſubject of our memoir was their firſt-born child. The family of Linnæus had been peaſants, but ſome of them, early in the 17th century, had followed literary purſuits. In the beginning of that century regular and hereditary ſurnames were firſt adopted in Sweden, on which occaſion literary men often choſe one of Latin or Greek derivation and ſtructure, retaining the termination proper to the learned languages, as Melander, even when the name itſelf was not taken from thence, as Retzius. A remarkable Linden-tree, *Tilia europæa*, growing near the place of their reſidence, is reported to have given origin to the names of Lindelius and Tiliander, in ſome branches of this family; but the above-mentioned Nicholas is ſaid to have firſt taken that of Linnæus, by which his ſon became ſo extenſively known. Of the taſte which laid the foundation of his happineſs as well as his celebrity, this worthy father was the primary cauſe. Reſiding in a delightful ſpot, on the banks of a fine lake, ſurrounded by hills and valleys, woods and cultivated ground, his garden and his fields yielded him both amuſement and profit, and his infant ſon imbibed, under his auſpices, that pure and ardent love of nature for its own ſake, with that habitual exerciſe of the mind in obſervation and activity, which ever after marked his character, and which were enhanced by a rectitude of principle, an elevation of devotional taſte, a warmth of feeling, and an amiableneſs of manners, rarely united in thoſe who ſo tranſcendently excel in any branch of philoſophy or ſcience, becauſe the cultivation of the heart does by no means ſo conſtantly as it ought keep pace with that of the underſtanding. The maternal uncle of Nicholas Linnæus, Sueno Tiliander, who had educated him with his own children, was alſo fond of plants and of gardening, ſo that theſe taſtes were in ſome meaſure hereditary. The young Charles, as he tells us himſelf, was no ſooner out of his cradle, than he almoſt lived in his father's garden. He was ſcarcely four years old when he heard his father deſcant, to a rural party, on the diſtinctions and qualities of ſome particular plants, culled from the flowery turf on which they were ſeated, and this firſt botanical lecture was ever after remembered as an epocha in his ſcientific life. He never ceaſed to enquire of his father concerning the names and properties of all the productions of the garden and the fields, that he could poſſibly procure; nor did the economy of inſects, even at this early period, eſcape his attention. His youthful inaptitude for retaining the names of natural objects, ſometimes tired and diſpleaſed his inſtructor, whoſe wholeſome authority in time corrected this defect, and perhaps early prevented his falling into the error of thoſe deſultory ſpeculators of nature, who have agreed to deſpiſe that methodical and didactic preciſion of ideas, which, for want of early diſcipline, they could never attain. The memory of Linnæus, indeed, like his powers of perception, was naturally good, and his ſight was always remarkably acute. The vivacity and brilliant expreſſion of his eyes are ſaid to have laſted through life, and indeed are diſplayed in moſt of his portraits.

Theſe flowery ſtudies however were obliged to give way, in ſome meaſure, to leſs agreeable occupations, and unhappily the private tutor proved a man of leſs winning manners than the beloved parent. Thus at ſeven years of age grammar had but an unequal conteſt with botany in the mind of the young ſtudent. Nor was he much more fortunate when removed in 1717 to the grammar-ſchool of Wexio, the maſter of which, as his diſguſted pupil relates, "preferred ſtripes and puniſhments to admonitions and encouragements." Such a ſyſtem was near extinguiſhing all the talents it was intended to cultivate, and when the youth was committed, two years afterwards, to the care of a more judicious and amiable private tutor than before, the horrors of the rod ſeem ſtill to have predominated over his taſte for learning. In 1722 he proved competent, nevertheleſs, to be admitted to a higher form in the ſchool, and his drier ſtudies were now allowed to be intermixed and ſweetened with the recreations of botany. In 1724, being 17 years of age, he was removed to the ſuperior ſeminary, or *Gymnaſium*, and his deſtination was fixed for the church. But the original inclinations of his mind, and its early prejudices, here grew but the more apparent. He had no taſte for Greek or Hebrew, ethics, metaphyſics or theology; but he devoted himſelf with ſucceſs to mathematics, natural philoſophy, and a ſcientific purſuit of his darling botany. The *Chloris Gothica* of Bromelius, and *Hortus Upſalienſis* of Rudbeck, which made a part of his little library, were calculated rather to fire than to ſatisfy his curioſity; while his Palmberg and Tillands might make him ſenſible how much more than they had accompliſhed ſtill remained to be done. His own copies of theſe books, uſed with the utmoſt care and neatneſs, are now before us. His literary reputation however made ſo little progreſs, that, when his father paid a viſit to Wexio, in 1726, his tutors, like the ſapient inſtructors of Newton at Cambridge, gave him up as a hopeleſs dunce. They adviſed that he ſhould be put apprentice to a ſhoemaker, tailor, or ſome other handicraft trade, rather than be forced to purſue an object, for which he was evidently unfit. Fortunately, the diſappointed parent met with a better counſellor in Dr. Rothmann, the lecturer on natural philoſophy, who encouraged him to hope much from the inclination of his ſon to natural knowledge and practical obſervation, and recommended that he ſhould be directed to the ſtudy of medicine. This good advice was ſupported with the gratuitous offer of taking the young man into his own houſe, for the year during which he was ſtill to remain at the *Gymnaſium*, which was gladly accepted. The worthy preceptor gave his pupil a private courſe of inſtruction in phyſiology on the Boerhaavian principles, and was rewarded by the ſucceſs of his endeavours. He firſt ſuggeſted to Linnæus the true principles upon which botany ought to be ſtudied, founded on the parts of fructification, and put the ſyſtem of Tournefort into his hands, in the knowledge of which he made a rapid progreſs. Its very imperfections proved uſeful, in prompting him to attempt ſomething more complete hereafter.

In 1727 Linnæus was matriculated at the univerſity of Lund, having, on the 19th of Auguſt, undergone with credit the examination of the Dean, and even of the Profeſſor of Eloquence, Papke. He devoted himſelf to the ſtudy of medicine, lodging at the houſe of a phyſician, Dr. Stobæus, whoſe library and muſeum of natural hiſtory, afforded the greateſt delight and aſſiſtance to his ardent mind, and the ſtudy of which often robbed him of ſeveral hours of his natural repoſe. In the ſame houſe was a German ſtudent named Koulas, eager like himſelf for inſtruction, and their friendſhip was mutually beneficial. Dr. Stobæus being infirm in health and ſpirits, Linnæus was allowed to relieve him occaſionally from the labours of his profeſſion, and ſoon became a great favourite. While botanizing in the country, in the ſpring of 1728, our young naturaliſt met with that accident, whatever it was, which he always attributed to the ſting or bite of his ſuppoſed *Furia infernalis*, an animal whoſe exiſtence has been doubted by many perſons, and by ſome poſitively denied. We need not here repeat what is ſaid under the article FURIA. His pupil Solander has recorded ſeveral caſes of this accident or diſeaſe, and deſcribes the animal as if he had ſeen it, in the *Nova Acta Upſalienſia*, v. 1. 55. In the enſuing ſummer Linnæus paſſed the vacation under his paternal roof. Here he met with his former patron Rothmann, by whoſe advice he was induced to quit Lund for Upſal, as a ſuperior ſchool of medicine and botany. But the ſlender ſupport which his father could afford him, a capital of about 8*l.* ſterling, being totally inadequate, he was, in this new ſituation, reduced to the greateſt neceſſity. Private pupils were not to be procured by a poor unknown ſtudent. He was obliged to truſt for chance to a meal; and when he relates that he had no way of mending his ſhoes but by folded paper, ſeems to have felt the want even of the cobler's education which had been recommended to him. He had offended his old friend Stobæus by quitting Lund, and though he had brought with him a ſplendid Latin teſtimonial, from the Rector of that univerſity, in which he was called *Politiſſimus ornatiſſimuſque dominus*, and was declared "to have conducted himſelf with no leſs diligence than correctneſs, ſo as to gain the affection of all who knew him," he ſeems to have obtained nothing more than a royal ſcholarſhip, which was conferred upon him on the 16th of December, but of the value of which we are not informed. It appears however by the above account to have been totally inſufficient for his maintenance. He nevertheleſs did not relax in his ſtudies; but attended the lectures of the younger Rudbeck, then Profeſſor at Upſal, as well as the medical ones of Profeſſor Roberg: and made critical manuſcript remarks upon all that he ſaw and heard.

In the autumn of 1729 his botanical taſte and application raiſed up for him a new and very eſtimable patron, in the learned Dr. Olaus Celſius, Profeſſor of Divinity, who met with him by chance in that academical garden, the fame of which he was deſtined hereafter to immortalize. This gentleman had then been intent, for above 30 years, upon the illuſtration of the plants mentioned in the Holy Scriptures, on which he publiſhed a very celebrated work in 1745, having travelled to the Eaſt on purpoſe to render it more perfect. He ſoon diſcovered the merit of Linnæus, took him under his protection, and allowed him the full uſe of his own rich library. The friendſhip of ſuch a man ſoon procured him further advantages. The ſon of Profeſſor Rudbeck, and other young men, became his private pupils, by which his finances were improved. Nothing however ſeems to have been recollected with ſo much ſatisfaction to himſelf, in relating the events of this part of his life, as his intimate ſcientific friendſhip with Peter Arctedius, who afterwards called himſelf Artedi, and became ſo famous in the knowledge of fiſhes and of umbelliferous plants. They paſſed ſome time together ſubſequently in Holland, when Linnæus witneſſed the melancholy fate of his friend, who was accidentally drowned at Amſterdam; of which he has prefixed ſo pathetic an account to the *Ichthyologia* of Artedi, publiſhed by his means.

During his ſtudies, under the roof of Celſius, Linnæus met with a review of Vaillant's treatiſe on the Sexes of Plants, which firſt led him to conſider the importance, and great varieties of form, of the ſtamens and piſtils, and thence to form a new ſcheme of arrangement founded on thoſe eſſential organs. He drew up an eſſay in oppoſition to the librarian of the univerſity, who had publiſhed a work *de Nuptiis Plantarum*, and ſhewed it to Celſius, who communicated it to Rudbeck, and the performance was honoured with the high approbation of both. This led the way to his being appointed to lecture in the botanic garden, as an aſſiſtant or deputy to the latter, whoſe advanced age rendered ſome relaxation neceſſary. The lectures of Linnæus began in the ſpring of 1730. He had previouſly ſolicited from the Profeſſor the humble appointment of gardener to the univerſity, which was refuſed, only on the ground of his being fit for a better ſituation. Now finding himſelf authorized to take the direction of the garden, he reformed and greatly enriched it. He was taken into the houſe of Rudbeck, as tutor to his younger children, and by this means had the uſe of a very fine collection of books and drawings. His mornings being devoted to the duties of his ſtation, his evenings were ſpent in preparing ſome botanical works. It was now that he began to write his *Bibliotheca Botanica*, *Claſſes Plantarum*, *Critica Botanica* and *Genera Plantarum*, though theſe books were not given to the world till about ſeven years afterwards, when he printed them in Holland, during his ſtay there.

A new object now engaged all the attention of our emulous young naturaliſt. The converſations of Rudbeck, concerning the natural hiſtory of Lapland, and the curioſities he had ſeen there, excited an irreſiſtible deſire in Linnæus to viſit the ſame country. To this he was perhaps the more immediately prompted, by ſome little circumſtances, which made his reſidence at Upſal uncomfortable. Theſe were, the jealouſy of Dr. Roſen, who was ambitious of ſucceeding Rudbeck whenever his Profeſſorſhips ſhould become vacant, and who by his ſucceſs as the only practiſing phyſician at Upſal, was likely to prove a formidable rival; as well as ſome domeſtic chagrin, which he thus relates. "The faithleſs wife of the librarian Norrelius lived at this time in Rudbeck's houſe, and by her Linnæus was made ſo odious to his patroneſs, that he could no longer ſtay there."—In the end of the year 1731 he retired to his native place, and ſoon received, from the Academy of Sciences at Upſal, an appointment to travel through Lapland, under the Royal authority, and at the expence of the Academy.

After a viſit to Lund in the ſpring of 1732, Linnæus ſet out from Upſal, May 12th, on his Lapland expedition. He travelled on horſeback, but ſlenderly provided with baggage, and after viſiting the Lapland alps on foot, and deſcending to the coaſt of Norway, of which he has given a moſt pictureſque and ſtriking deſcription, returned by Tornea, and the eaſt ſide of the Bothnian gulf, to Abo, and ſo to Upſal, which he reached on the 10th of October, having performed a journey of near 4000 Engliſh miles. The particulars of his intereſting expedition have lately been given to the public, in an Engliſh tranſlation of the original journey written on the ſpot, illuſtrated with wooden cuts from his own ſketches, making two octavo volumes. This document, a faithful tranſcript of his own mind, and written ſolely for his own uſe, gives a moſt amiable and reſpectable idea of the character and acquirements of this celebrated man, at this period of his life.

Having learned the art of aſſaying metals during ten days' reſidence at the mines of Biorknas, near Calix, in the courſe of his tour, he next year gave a private courſe of lectures on that ſubject, which had never been taught at Upſal before. The jealouſy of Roſen, however, ſtill purſued him; and this rival deſcended ſo low as to procure, partly by intreaties, partly by threats, the loan of his manuſcript lectures on botany, which Linnæus detected him in ſurreptitiouſly copying. Roſen had taken by the hand a young man named Wallerius, who afterwards became a diſtinguiſhed mineralogiſt, and for whom he now procured, in oppoſition to Linnæus, the new place of *adjunct*, or aſſiſtant, in the medical faculty at Lund. But the baſeſt action of Roſen, and which proved envy to be the ſole ſource of his conduct, was, that having married the niece of the archbiſhop, he obtained, through his lordſhip's means, an order from the chancellor to prevent all private medical lectures in the univerſity. This, for which there could be no motives but conſcious inferiority and malice, deprived Linnæus of his only means of ſubſiſtence, and the ſtudents of any information which might endanger their reverence for his rival. He is ſaid to have been ſo exaſperated, as to have drawn his ſword upon Roſen, an affront with which the latter choſe to put up, as, doubtleſs, became the proſperous nephew of an archbiſhop; but Linnæus cannot be exculpated of having, for ſome time afterwards, indulged feelings of paſſionate reſentment, and even of meditated revenge. Theſe, however, his better principles and diſpoſitions, after a while, entirely ſubdued, and Roſen, towards the cloſe of his life, was glad of the medical aid of the man he had in vain endeavoured to cruſh.

Diſappointed in his views of medical advancement, Linnæus turned his thoughts more immediately to the ſubject of mineralogy. In the end of the year 1733, he had viſited ſome of the principal mines of Sweden, and had been introduced to Baron Reuterholm, governor of the province of Dalarne, or Dalecarlia, reſident at Fahlun. This place Linnæus has perpetuated in the memory of botaniſts, by his *Lichen Fahlunenſis*, a production more reſembling ſome ramification of the neighbouring copper ores, than any thing of vegetable origin. At the perſuaſion, as well as at the expence, of the governor, he travelled through the eaſtern part of Dalecarlia, accompanied by ſeven of his ableſt pupils, and the unpubliſhed journal of his tour exiſts in his library. At Fahlun he gave a courſe of lectures on the art of aſſaying, which was numerouſly attended, and here he firſt became acquainted with Browallius, then chaplain to the governor, afterwards biſhop of Abo. This judicious friend adviſed Linnæus to take his doctor's degree, in order to purſue the practice of phyſic, in which he had already at Fahlun met with much ſucceſs, and he further recommended him to aim at ſome advantageous matrimonial connection. Dr. John Moræus, a phyſician of the place, though at firſt not prepoſſeſſed in favour of our young adventurer, whoſe medical ſucceſs had encroached on his own, allowed him to pay his addreſſes to his eldeſt daughter; but their union was for the preſent deferred.

In purſuit of the plan pointed out by Browallius, Linnæus, having ſcraped together about 15*l*. ſterling, now entered on his travels, with a view of obtaining his degree at the cheapeſt univerſity he could find, and of ſeeing as much of the learned world as his chances and means might enable him to do. In the beginning of the year 1735 he ſet out, after viſiting his father, lately become a widower, in company with another medical ſtudent, named Sohlberg. At Hamburgh his ſkill and honeſty unfortunately ſtood in his way. The brother of one of the burgomaſters was poſſeſſed of a ſpecimen of that reputed wonder, a Hydra with ſeven heads, the awe and admiration of all who beheld it, upon which its owner, in the true mercantile ſtyle, had fixed an enormous hypothetical value. His golden dream was deſtroyed by Linnæus, who proved the monſter to be artificial.

After a ſtay of eight days at Amſterdam, Linnæus proceeded to Harderwyck, where, having offered himſelf as a candidate, and undergone the requiſite examinations, he obtained his degree June 23, 1735. On this occaſion he publiſhed and defended a theſis, entitled *Hypotheſis Nova de Febrium Intermittentium Cauſâ*, in the dedication of which, to his *Mæcenates et Patrones*, it is remarkable that, among the names of Rudbeck, Rothmann, Stobæus, Moræus, &c. we find that of Roſen. The hypotheſis here advanced, moſt correctly ſo denominated, is truly Boerhaavian. Intermittent fevers are ſuppoſed to be owing to fine particles of clay, taken in with the food, and lodged in the terminations of the arterial ſyſtem, where they cauſe the ſymptoms of the diſorder in queſtion. If we ſmile at the theory, we cannot but admire the ingenuity with which it is ſupported, and the extent of the author's knowledge and obſervation; nor is the theory itſelf at all leſs reſpectable, than thoſe which make a figure in the humoral pathology, univerſally taught at that period, by ſome of the greateſt medical philoſophers of any age.

In Holland Linnæus became acquainted with Dr. John Frederick Gronovius (ſee GRONOVIUS), who aſſiſted him in publiſhing the firſt edition of the celebrated *Syſtema Naturæ*, conſiſting of eight large ſheets, in the form of tables; which edition is now a great bibliothecal curioſity. He alſo procured acceſs to the illuſtrious Boerhaave, who encouraged him to remain in Holland; but this advice could ſcarcely have been followed, had he not met with a patron in Burmann, of Amſterdam, who was then preparing his *Theſaurus Zeylanicus*, and who received Linnæus into his houſe, as his gueſt for ſome months, during which period he printed his

Fundamenta Botanica, a ſmall octavo of 36 pages, in the form of aphoriſms, which contains the very eſſence of botanical philoſophy, and has never been ſuperſeded nor refuted. The ſubſequent performances of the author himſelf, and of his followers, have been excellent, in proportion as they have kept to the maxims of this little book. After Linnæus had been a few months under profeſſor Burmann's roof, he was introduced by Boerhaave to Mr. George Clifford, an opulent banker, whoſe garden at Hartecamp was one of the richeſt in the world, and who thought himſelf happy in the opportunity of procuring ſuch a man to ſtudy and ſuperintend his collection, as well as to make known to the world any novelties it might contain. Linnæus was therefore removed to Hartecamp, where, as he ſays, "he lived like a prince," more glorious, no doubt, than an Aſiatic deſpot, in the innumerable vegetable tribes which daily offered their homage at his feet. With an ample library, as well as garden, at his command, in both which he had unlimited powers to ſupply any defects that he might diſcover, he had now the means of cultivating his beloved ſcience without reſtriction or impediment, and appears to have been truly ſenſible of the happineſs of his lot. He now wrote and printed his admirable *Flora Lapponica*, the plates of which were ſupplied by the contributions of a ſociety at Amſterdam. This work, one of the happieſt literary compoſitions of its author, is ſtrikingly characteriſtic of the ſtate of his mind at the time it was written. It is redundant in obſervation and reflection, on every ſubject which could be interwoven with its profeſſed object, conveyed in the moſt engaging ſtyle; a ſtyle independent of ſtudied phraſeology, flowing directly from the heart, and deriving its principal charm from the delight which the author takes in what he has to communicate. The enthuſiaſm with which his imagination retraces every idea of his Lapland expedition, turns the wild ſcenes of that country, even in the mind of his reader, into a paradiſe, inhabited by all that is innocent and good. His effuſions reſemble the longings of an exiled Swiſs; and are in fact incipient ſymptoms of that oppreſſion of the heart, which, after a while, rendered his abode in Holland, with all its ſcientific charms, no longer tolerable, to one born in the purer air of Sweden, and nurtured amongſt her Lapland alps.

The proſperous condition of Linnæus, under the patronage of Mr. Clifford, afforded him much more than a ſelfiſh gratification, when he met with his old friend Artedi, at Amſterdam, deſtitute of the means of proſecuting his ſtudies, obtaining his degree, or even of ſupporting himſelf with credit or decency. "He had ſpent all his money in London;" an accident not peculiar to a poor Swediſh ſtudent; and would now have been deſtitute but for the exertions of his friend, who recommended him to Seba, to whom the learning and abilities of Artedi were peculiarly ſerviceable, in completing the third volume of his magnificent *Theſaurus*, chiefly devoted to fiſhes. We have already alluded to the unfortunate cataſtrophe of this young man, and a ſhort ſketch of his life is given in its proper place. See Artedi.

In 1736, after having written his *Muſa Cliffortiana*, Linnæus was ſent by Mr. Clifford to England, and was introduced to the lovers and teachers of natural ſcience, at Oxford and London more eſpecially. Of his reception from the Sherardian Profeſſor, we have already ſpoken. (See Dillenius.) He was ſtrongly recommended by Boerhaave, in a letter which ſtill exiſts, to ſir Hans Sloane; but this indefatigable collector neither underſtood nor cared for thoſe improvements in botanic ſcience which he might have learned from his viſitor. Linnæus found more intelligent and communicative friends in Dr. Shaw, the oriental traveller, profeſſor Martyn the elder, the well-known Philip Miller, and the celebrated Peter Collinſon. (See Collinson.) Theſe men of true ſcience admired his genius and valued his friendſhip; they promoted his wiſhes by every means in their power, enriching him with books; and ſupplying him plentifully with plants, both for his own herbarium, and the garden of his patron at Hartecamp. He was much ſtruck with what he ſaw of London, and has celebrated it in an expreſſion which has often been repeated, calling this famous city the "*punctum ſaliens in vitello orbis.*" Of his obſervations on the natural hiſtory of this country, nothing is preſerved but a tradition, that the golden bloom of the furze on the commons near London, eſpecially Putney-heath, delighted him ſo much, that he fell on his knees in a rapture at the ſight. He was always an admirer of this plant, and laboured in vain to preſerve it through a Swediſh winter in his greenhouſe; as we in England are obliged to ſhelter the Cape ſhrub in a ſtove, though it covers walls in the open air at Paris.

On his return to Holland, he continued the impreſſion of his *Genera Plantarum*, which appeared in 1737. In October, 1736, he was made a member of the Imperial Academy *Naturæ Curioſorum*, by the title, according to the cuſtom of that body, of Dioſcorides ſecundus. He was now tempted by Boerhaave to undertake a botanical expedition to the Cape of Good Hope and to America, at the public expence, and flattered with the expectation of a Profeſſorſhip in Holland at his return; but he neither choſe to encounter the hazards of the undertaking, nor to give up his proſpects at home. He would not however leave the benefactor to whom he owed ſo much, till he had accompliſhed all that was to be expected from him. He printed in 1737 the *Viridarium Cliffortianum*, an octavo catalogue of his friend's garden, diſpoſed according to his own ſexual ſyſtem; of which he publiſhed, later in the ſame year, at Leyden, an exemplification under the title of *Methodus Sexualis*, in which all the known genera of plants are ſo arranged by name only. This year alſo produced his magnificent *Hortus Cliffortianus*, in folio, in which all the plants of Mr. Clifford's collection, whether living or dried, are enumerated, with many deſcriptions and highly intereſting remarks, an almoſt complete detail of ſynonyms, and ſome of the moſt exquiſite plates ever ſeen in any book. This ſplendid volume was not publiſhed, but only given away by Mr. Clifford. It was begun and completed in nine months. In the intervals of this labour the *Critica Botanica*, an octavo volume, was written and printed. This is an entertaining commentary and illuſtration of part of the *Fundamenta*, from ſection 210 to 324, relating to nomenclature and ſpecific characters. It is a book not ſo much known as it deſerves, being very rare. Theſe ſevere labours however proved too much for the health of Linnæus, and he conceived that the autumnal air of Holland, as is very probable, did not agree with him. Though he had every luxury and indulgence at his command, and was careſſed by his patron, and by all who came near him, with the moſt flattering attentions, he longed to return to his native country. Having left Mr. Clifford, he could not refuſe his aſſiſtance for a while to Profeſſor Adrian Van Royen at Leyden, in the arrangement and deſcription of the garden there, which ſeems rather to have diſpleaſed his late patron, and not perhaps without reaſon, after the ſtrong inducements he had offered to retain him. Linnæus excuſed himſelf as well as he could, and while giving his aſſiſtance to Van Royen, compoſed and printed the *Claſſes Plantarum*, which is a complete view of all the botanical ſyſtems ever known. Here alſo he publiſhed his friend

Artedi's *Ichthyologia.* Boerhaave made another attempt to induce him to viſit ſome exotic regions, offering him a medical appointment at Surinam, which it is happy he did not accept. His friend and great favourite Bartſch, who was ſent in his ſtead, fell a ſacrifice to the climate, and to the neglect and ill uſage he received from the governor, as Linnæus has feelingly related in his *Flora Suecica,* under the genus *Bartſia.*

Linnæus remained at Leyden till the ſpring of 1738, when he had an intereſting interview with the great Boerhaave, then on his death-bed. "I have lived out my time," ſaid the venerable invalid. "I have done what I could, may God preſerve thee, from whom the world expects much more. Farewel!" Whether the climate of Holland cooperated with dejection of ſpirits in our young Swede, in conſequence of news he received reſpecting a rival in the affections of his miſtreſs, and in the eſteem of his intended father-in-law, or whether his literary labours were too unremitting, his departure was prevented by a very formidable intermittent fever. The ſkill of Van Swieten, and the renewed attentions of the amiable Clifford, who received him again under his roof with the moſt liberal and indulgent kindneſs, after ſome weeks reſtored him ſo far, that he was able, though ſtill weak, to ſet out on his journey. On reaching the more elevated country of Brabant, he felt in one day quite renovated, his whole frame being, as he expreſſes it, "freed from ſome great burthen." He carried a very handſome introductory letter from Van Royen to Anthony de Juſſieu, the phyſician, who made him acquainted with his brother, the famous Bernard de Juſſieu. (See JUSSIÆA.) He inſpected the botanic garden, the herbariums of Tournefort, Vaillant, the Juſſieus, &c.; viſited the neighbourhood of Fontainebleau, which he has celebrated for its *Orchideæ,* formed an acquaintance with Reaumur and other diſtinguiſhed naturaliſts, and was admitted a correſponding member of the *Academie des Sciences.*

How he converſed with Reaumur and others, who knew no language but their own, and for the ſame reaſon, how he contracted ſo cloſe a friendſhip with Mr. Collinſon at London, it is not eaſy to conceive. He confeſſes a peculiar inaptitude, and, we think, a blameable indifference, for the learning of languages, declaring in his diary that in all his travels he learnt "neither Engliſh, French, German, Laplandiſh, nor even Dutch, though he ſtayed in Holland three whole years. Nevertheleſs, he found his way every where, well and happily." By the journal of his Lapland tour, and other manuſcripts, it appears that Latin was ſufficiently familiar to him; and if faſtidious critics, who are not competent to follow his ideas, may ſometimes cenſure the ſtyle of part of his writings, they have chiefly taken that liberty with the *Amœnitates Academicæ,* not remarking the great variety of ſtyle in the eſſays which compoſe thoſe volumes, and which are chiefly written by the pupils whoſe inaugural diſſertations they were. The matter indeed was moſtly communicated by the Profeſſor, whoſe office it was to defend each theſis, in conjunction with the candidate, againſt all oppoſers. Thus theſe eſſays are always quoted as the works of Linnæus, though their language is rarely his own; and is indeed ſo various, that it could not be ſuppoſed all to come from one author.

After leaving Paris, Linnæus took his paſſage at Rouen for Sweden, and landed at Helſingborg, from whence he proceeded to Fahlun, viſiting his father for a few days in his way. His reception from the lady of his choice was favourable, and they were formally betrothed to each other. Before they could marry, it was neceſſary that ſome proſpect of an advantageous eſtabliſhment ſhould be diſcovered. Stockholm was thought a promiſing theatre for a young man of talents in the medical profeſſion, but talents are uſually what thoſe who employ a young phyſician, are of all things leaſt able to judge of. If fortune or prejudice do not ſtand his friend, the ſkill of Hippocrates, Celſus or Boerhaave will ſcarcely be diſcerned. The ſcientific merits of Linnæus were not overlooked, as he was unanimouſly choſen a member of the Upſal academy, the only one then in Sweden; yet the homage he had ſo lately received abroad, ſeems to have made him a little unreaſonable on this head, and he declares that he would certainly have quitted his native country, "had he not been in love." To this all-powerful deity therefore, and not to his merits, or to the wiſdom of his countrymen in diſcerning them, was Sweden, in the firſt inſtance, indebted for the poſſeſſion of her Linnæus. From his country however flowed his moſt abundant reward; for whatever emolument his matrimonial connexion might afford, it certainly brought him little happineſs or honour. After paſſing the winter of 1738 in the capital, he began to make his way in ſome departments of medical practice, ſo that by the following March he had conſiderable employment. At this time a plan was formed for eſtabliſhing a literary ſociety at Stockholm, which afterwards roſe to great eminence, and ſtill continues to flouriſh, having publiſhed numerous volumes of Tranſactions, in the Swediſh language. Triewald, Höpken and Alſtroem, (whoſe family was ennobled by the name of Alſtroemer,) were, with Linnæus, the firſt members: and the infant ſociety, being incorporated by royal authority, was augmented with all the moſt learned men of the country. Its objects were declared to be natural philoſophy, natural hiſtory in all its branches, chemiſtry, medicine, anatomy, ſurgery, mathematics, economy, commerce, arts and manufactures. So wide a range might have been feared to have endangered its ſucceſs; but though, in its progreſs, theſe various ſtudies have, from time to time, predominated by turns, they ſeem not to have claſhed with each other. Part of its tranſactions has been publiſhed in Latin at Venice, under the title of *Analecta Tranſalpina,* which is ſome reproach to other countries of Europe, where they are ſo very little known.

A moſt flattering mark of public approbation was, ſoon after, conferred on Linnæus, without any ſolicitation. Count Teſſin, marſhal of the Diet, which was then ſitting, gave him an annual penſion of 200 ducats from the board of mines, on condition of his giving public lectures on botany and mineralogy at Stockholm. The ſame nobleman alſo obtained for him the appointment of phyſician to the navy, and received him into his houſe. His practice now increaſed greatly among the nobility, and he found himſelf in ſo proſperous a condition that he would no longer delay his marriage, which took place at Fahlun, June 26. 1739. After a month he returned to Stockholm. He was, by lot, the firſt preſident of the new academy; and as that office was to be but of three months' duration, after the French plan, he reſigned it in September, and on that occaſion delivered an oration in Swediſh, on the wonderful Economy of Inſects, which was printed in the Tranſactions; and a Latin verſion of it may be found in the *Amœnitates Academicæ,* v. 2. His example was followed by all the ſucceeding preſidents.

The death of profeſſor Rudbeck in 1740, gave Linnæus a hope of ſucceeding to the botanical chair at Upſal, one of the greateſt objects of his ambition. The prior claims of his former rival, Roſen, on account of his ſtanding in the univerſity, could not however be ſet aſide. Wallerius alſo roſe up in oppoſition to the claims of Linnæus. It happened however that Roberg reſigned the profeſſorſhip of phyſic about this time, and by the exertions of count Teſſin, who applied to the chancellor, count Gyllenborg, a compromiſe took place. Roſen obtained the profeſſorſhip of botany, and Linnæus that of medicine, whilſt Wallerius gained only cenſure for the illiberality with which he had proſecuted his claims. By an amicable adjuſtment which was confirmed by authority, the two new profeſſors afterwards divided their official duties between them, ſo as beſt to ſuit the talents of each.

A war chancing to break out between Sweden and Ruſſia, Linnæus was apprehenſive that he ſhould be obliged to attend the fleet, inſtead of which, however, he received the much more agreeable order to travel through Æland, Gothland, &c. for the purpoſe of inveſtigating the natural hiſtory and produce of thoſe countries. He was accompanied by ſix of his pupils, and ſpent four months of the ſummer of 1741 in his expedition, of which an account was publiſhed at Stockholm in 1745; before he began his lectures at Upſal, to which place he removed in the autumn, he delivered a Latin oration "On the Benefit of travelling in one's own Country," printed in the 2d vol. of the *Amœnitates*, and tranſlated by Mr. Stillingfleet in his Miſcellaneous Tracts. This compoſition has been much and juſtly admired.

The next year Linnæus undertook the reform of the Upſal garden, a new green-houſe was erected; an old houſe of ſtone, built by the great Olaus Rudbeck, who, having ſuffered ſo much by fire, would not admit a bit of wood into the ſtructure, "was converted," as Linnæus ſays, "from an owl's neſt into a lodging fit for the Profeſſor." In 1743 the garden was in a ſtate to receive thoſe copious ſupplies of exotics, which the new Profeſſor, in conſequence of his extenſive foreign correſpondence, was enabled to procure. He was this year choſen a member of the academy at Montpellier. His reputation continued to increaſe both abroad and at home; he became ſecretary of the Upſal academy, and was employed on ſome public occaſions to do the honours of the univerſity. The death of his father-in-law obliged him to pay a viſit to Fahlun, but he ſeems to have gained little by this event, except the old medical library of Dr. Moræus, which ſtill makes a part of his own. In 1746 he travelled to Weſt Gothland; an account of his journey, which occupied two months, was publiſhed the following year.

In 1745 Linnæus publiſhed the firſt edition of his *Flora Suecica*, and in 1746 his *Fauna Suecica* came out. Theſe works are models for ſuch compoſitions, eſpecially their ſecond editions, publiſhed many years afterwards, with ſpecific names, and many valuable additions.

A medal of this diſtinguiſhed man was ſtruck by ſome of his friends in 1746, dedicated to count Teſſin. He ſoon after received the rank and title of Archiater, unſolicited, from the king, and was the only Swede choſen into the new-modelled academy of Berlin. All theſe honours, however, though he was by no means indifferent to ſuch, appear to have given him leſs delight at this moment, than the acquiſition of the herbarium made by Hermann in Ceylon, which an apothecary at Copenhagen unknowingly poſſeſſed. Being deſirous of becoming better acquainted with the nature of this collection, its owner was recommended to Linnæus, who ſoon diſcovered to whom it had originally belonged, and rejoiced at recovering a treaſure which had been ſuppoſed irrecoverably loſt. He laboured day and night, as he tells us, in examining the flowers, and hence originated his *Flora Zeylanica*, publiſhed at Stockholm in 1747. This herbarium, as well as that of Clifford, is now in the poſſeſſion of ſir Joſeph Banks.

The exertions, and domeſtic as well as foreign reputation, of Linnæus, had now rendered botany extremely popular in Sweden, and its intereſts were combined with thoſe of commerce in various diſtant expeditions and ſpeculations. Many of the principal merchants, as well as the nobility, had acquired a taſte for natural hiſtory, and were proud to further the views of their diſtinguiſhed Profeſſor, who was now conſidered an honour to the nation. Several of his moſt intelligent pupils were ſent to ſuch diſtant countries, as he thought moſt worthy to be explored; as the Eaſt Indies, China, North and South America, and the Holy Land. (See HASSELQUIST, KALM, and LŒFLINGIA.) Their diſcoveries enriched his works and his herbarium. The latter alſo received important and very intereſting communications from Gmelin and others, who had viſited Siberia, and the original collections of Magnol and Sauvages were tranſmitted from Montpellier. Gronovius alſo furniſhed many Virginian ſpecimens, gathered by Clayton. Such communications, from all parts of the world, grew more and more frequent as Linnæus advanced in life, as did alſo the academical honours which every literary body was proud to confer upon him. In 1749 appeared his *Materia Medica*, written in the ſame ſyſtematic and didactic ſtyle as the reſt of his works. Of this numerous editions have been publiſhed on the continent, but none with any additions or corrections from the author himſelf, though he has left behind him copious manuſcript notes on the ſubject. By the curious frontiſpiece of this book, one would ſuppoſe that he laughed in his ſleeve at the ſtate of medical practice in the world, though the body of the work proves he laboured very ſeriouſly to improve it. This year he travelled through Scania, &c. and, two years afterward, publiſhed an account of this tour, as he had done of the former. It is much to be regretted that theſe travels of Linnæus are not given to the world in a language more generally underſtood. There are German tranſlations of them, but we know of no others. He was this year rector of the univerſity, and it was memorable to him alſo for an attack of the gout, ſo violent as to endanger his life. He always attributed his reſtoration from this fit, and other ſubſequent ones, to his eating wood ſtrawberries, the only ſort, then at leaſt, known in Sweden. Of this fruit his ſervants were ordered to purchaſe, throughout the ſeaſon, all that were brought to his door, and it made a principal part of his diet.

To this attack of the gout, however diſtreſſing to the patient, the world is indebted for one of his moſt valuable and remarkable works, the *Philoſophia Botanica*. The ſubſtance of this book muſt have been comprehended in the mind of its author when he wrote his *Fundamenta Botanica*; of which it is profeſſedly a dilatation or exemplification, in the form of a commentary on each aphoriſm throughout. But, though he had long meditated on the ſubject of this publication, which embraces the whole range of botanic ſcience, and indeed all the principles of natural knowledge; he had made but a few notes, not being able to digeſt or ſelect his ideas, ſufficiently to his own ſatisfaction, to communicate them to others. This illneſs however prompted him to reſcue from the grave, to which he ſuppoſed himſelf haſtening, whatever might be of ſervice to thoſe he left behind; and his pupil Lœfling was employed, ſitting by his bed-ſide, to write down whatever the intervals of his ſufferings would allow him to communicate. The manuſcript afterwards received his own corrections, and the book came out in 1751.

About this period the queen of Sweden, Louiſa Ulrica, ſiſter to the great Frederick of Pruſſia, having a taſte for natural hiſtory, which her royal conſort king Adolphus Frederick alſo patroniſed, ſhewed much favour to Linnæus. He was employed in arranging her collection of inſects and ſhells, in the country palace of Drotningholm, or Ulrickſdahl, and was frequently honoured with the company and converſation of their majeſties, during his attendance there. The queen intereſted herſelf in the education of his ſon, and promiſed to ſend him to travel through Europe at her own expence. She alſo liſtened very graciouſly to any recommendation or petition of Linnæus, in the ſervice of ſcience; redeeming the papers and collection of Haſſelquiſt, and cauſing Kœhler to be ſent to the Cape of Good Hope; whoſe miſſion however was rendered abortive by the jealouſy of the Dutch, though he forwarded many curious inſects and plants to his maſter from Italy. Linnæus devoted ſome of his leiſure time in winter, to the arrangement of his friend count Teſſin's collection of foſſils, at Stockholm, of which an account in Latin and Swediſh, making a ſmall folio, with plates, came out in 1753. The reſult of his labours at Drotningholm was not given to the public till many years after, in 1764, when his *Muſeum Reginæ* appeared, in 8vo. being a ſort of *Prodromus* of an intended more ſplendid work, that was never executed. His moſt magnificent publication appeared in 1754, being a large folio, entitled *Muſeum Regis Adolphi Frederici*, comprehending deſcriptions of the rarer quadrupeds, birds, ſerpents, fiſhes, &c. of the king's muſeum, in Latin and Swediſh, with plates, and an excellent preface. This preface, one of the moſt entertaining and eloquent recommendations of the ſtudy of nature, that ever came from the pen of an enthuſiaſtic naturaliſt, was tranſlated into Engliſh by the writer of the preſent article, and firſt printed in 1786; appearing again, in a volume of *Tracts relating to Natural Hiſtory*, in 1798. The queen of Sweden took ſo much pleaſure in the converſation of her diſtinguiſhed naturaliſt, that ſhe allowed him his habitual indulgence of ſmoking, even in her apartments, that he might continue his labours with the more eaſe and ſatisfaction to himſelf. He was in every reſpect politely treated, as a viſitor to his royal miſtreſs, nor were his ſervices accepted, without ſuitable returns of royal munificence. Whether, however, he felt not ſo entirely at eaſe as in his own ſtudy, or his attention was diſtracted by a variety of objects, the *Muſeum Reginæ* is certainly not one of his moſt correct works, as thoſe who ſtudy its *Lepidoptera* and ſhells, with critical care, will not fail to diſcover.

In the mean while, this eminent man was preparing a laſting monument of his own talents and application, which even his rival Haller nobly denominates "*maximum opus et æternum*," the *Species Plantarum*, of which the firſt edition was printed in 1753, the ſecond in 1762, each in two volumes 8vo. The work is too well known to need any deſcription, but beſides its importance as a complete arrangement and definition, with all neceſſary indication of ſynonyms, of every plant of which its author had any ſatisfactory knowledge, it is ever memorable for the adaptation of ſpecific, or as they were at firſt called, trivial names. This contrivance, which Linnæus firſt uſed in his *Pan Suecicus*, a diſſertation printed in 1749, extended to minerals in his *Muſeum Teſſinianum*, and ſubſequently to all the departments of zoology, has perhaps rendered his works more popular than any one of their merits beſides. His ſpecific differences were intended to be uſed as names; but their unavoidable length rendering this impracticable, and the application of numeral figures to each ſpecies, in Haller's manner, being ſtill more burthenſome to the memory, all natural ſcience would have been ruined for want of a common language, were it not for this ſimple and happy invention. By this means we ſpeak of every natural production in two words, its generic and its ſpecific name. No ambiguous compariſons or references are wanted, no preſuppoſition of any thing already known. The diſtinguiſhing character of each object is moſtly ſtamped in its name; and if this perfection of the art cannot always be attained, the memory is aſſiſted, often very ingeniouſly, with collateral information, indicating the colour, the habit, or the qualities of the object of our examination. The philoſophical tribe of naturaliſts, for ſo they are called by themſelves and their admirers, do not therefore depreciate Linnæus, when they call him a nomenclator. On the contrary, they celebrate him for a merit which no other perſon has attained, and without which their own diſcoveries and remarks, of whatever value, would not be underſtood. Neither can ſome of his fellow labourers, in the diſcriminative department of natural ſcience, be juſtified, for either ſlighting this invention, or giving the credit of it to others. The method of Rivinus is not the ſame; as he deſigned his names for ſpecific characters, to which purpoſe they are neceſſarily, from their brevity, inadequate. Whatever may have been thought of the Linnæan trivial names at their firſt appearance, they are now in univerſal uſe, and their principle has been, with the greateſt advantage, extended to chemiſtry, of which the celebrated Bergman, the friend of Linnæus, originally ſet the example.

Theſe herculean literary labours, combined with the practice of phyſic, were more than the bodily conſtitution of Linnæus could ſupport. He was attacked with the ſtone, and had alſo, from time to time, returns of gout. He conſidered the wood ſtrawberry as a ſpecific for both diſorders, and they never greatly interfered with his comfort or his duties. On the 27th of April 1753, he received, from the hand of his ſovereign, the order of the Polar Star, an honour which had never before been conferred for literary merit. A ſtill more remarkable, if not more grateful, compliment was paid him not long after by the king of Spain, who invited him to ſettle at Madrid, with the offer of nobility, the free exerciſe of his religion, and a ſplendid botanical appointment. This propoſal was conveyed to him in a handſome letter by the duke of Grimaldi, then prime miniſter, and was as handſomely declined by Linnæus, who declared, that if he had any merits, they were due to his own country. This patriotic moderation received its juſt reward in November 1756, when he was raiſed to the rank of Swediſh nobility, and took the name of Von Linné.

The *Syſtema Naturæ* had already gone through nine editions in different countries. Its author had, for ſeveral years, a more ample edition of the animal department in contemplation, on the plan of his *Species Plantarum*, and this conſtituted the firſt volume of the tenth edition, publiſhed in 1758. The ſecond volume, which came out the following year, was an epitome of the vegetable kingdom. Here the genera appear with ſhort eſſential characters, and the ſpecies are noted by little more than their ſpecific differences, with few references and no indication of their native countries. This ſame great and important work appeared ſtill more enlarged, in a twelfth edition, in the year 1766: to this the Mineral kingdom was added in a third volume on the ſame plan with the firſt. We can readily pardon the ſelf-complacency of its author, when, in his diary written for the uſe of his friend Menander, he calls the *Syſtema Naturæ* "a work to which Natural Hiſtory never had a fellow." We may venture to predict that as this was the firſt performance of the kind it will certainly be the laſt; the ſcience of natural hiſtory is now become ſo vaſt, that no man can ever take the lead again as an univerſal naturaliſt.

The emoluments of Linnæus by his various publications were not great. He is reported to have ſold the copy-right of moſt of them for a ducat, (about nine and ſixpence,) a printed ſheet. His different appointments, however, for he ſoon laid aſide the general practice of phyſic, had raiſed him to a conſiderable degree of opulence. He purchaſed the eſtates of Hammarley and Söfja in 1758, for 80,000 dollars, above 2330*l.* ſterling. He choſe the former for his country reſidence, and there, ſome years afterwards, he lodged his muſeum, in a building of ſtone, ſecured from all danger by fire. There he received the viſits of diſtinguiſhed foreigners and admitted his favourite pupils; to ſeveral of whom he gave private courſes of Lectures, and completely laid aſide the ſtate of the nobleman and profeſſor while he diſcourſed with them on his favourite topics. In 1760 he could not reſiſt the temptation of writing in ſupport of his doctrine of the ſexes of plants, a handſome premium being offered that year by the Peterſburg academy, as it was ſuppoſed with a view to awaken his attention to the ſubject. His Diſſertation was printed, and was tranſlated into Engliſh in 1786, with notes, by the preſent poſſeſſor of his library. His patent of nobility did not receive his Majeſty's ſign manual till 1761, though it was antedated 1757. It was confirmed by the Diet in 1762, and he then took a coat of arms expreſſive of the ſciences he cultivated. That auguſt body honoured him with a ſtill more ſolid reward, upwards of 520*l.* ſterling, for what ſeems to have been the leaſt valuable of his diſcoveries, the art of producing pearls in the river muſcle. This was accompliſhed by wounding the ſhells in their natural ſituation, as appears by ſome ſpecimens illuſtrative of it in his muſeum, but the practice does not ſeem to have been proſecuted to any great extent.

He now became one of the eight foreign members of the French Academy of Sciences, an honour never before conferred on a Swede. Amid all his dignities however, his fondneſs for botany never declined; he records in his diary that having made many trials in vain to obtain the tea plant alive, he ſucceeded at length in 1763, adding "that God bleſſed him even in this point." His view indeed was patriotic as well as botanical, aiming at bringing this ſhrub into cultivation with us, ſo as, to uſe his own expreſſion, "to ſhut the gate through which all the ſilver went out of Europe." It is much to be regretted that, from ſome peculiarity in the conſtitution of this precious vegetable, all attempts to reconcile it to the climate of any part of Europe have proved of no avail, at leaſt as to any economical purpoſe.

In 1763 Linnæus was permitted to avail himſelf of the aſſiſtance of his ſon, now 21 years of age, in the labours of the Botanical Profeſſorſhip, and the young man was thus trained up for his future ſucceſſor. His eldeſt daughter was married to an officer in 1764. His worldly concerns appear to have been in a proſperous train, except that he ſuffered this year from a dangerous attack of pleuriſy; but it is pleaſing to read, in his private memorandums, the gratitude he expreſſes to his old rival Roſen, for his ſkill and attention during this illneſs, and the expreſſions of intimate regard by which they were now become attached to each other.

This year the ſixth edition, by far the moſt complete, of the *Genera Plantarum* was publiſhed, nor did its author ever prepare another. It was intended as a companion to the *Species Plantarum*, but was greatly ſuperſeded by the more conciſe and commodious ſhort characters of genera, given in the vegetable part of the *Syſtema Naturæ*. This laſt-mentioned part was ſubſequently prepared, under the inſpection of Linnæus, for publication by his pupil Murray of Göttingen, with the title of *Syſtema Vegetabilium*, edition 13th, and printed in 1774. A 14th edition, with additions from Jacquin and Thunberg, was publiſhed in 1784. Into theſe editions were interwoven the new ſpecies deſcribed by Linnæus in his firſt and ſecond *Mantiſſæ*, two little volumes, containing additions and corrections, by way of ſupplement to the *Species Plantarum*. In them we cannot help perceiving a decline of the wonted preciſion and genius of their author, eſpecially in the latter part of the ſecond *Mantiſſa*, many remarks in which are miſapplied, to plants different from what were intended, and the errors to which they give birth can be unravelled by the inſpection of the Linnæan herbarium only.

Though Linnæus declares, in his diary, that he gave up the general practice of phyſic, on his eſtabliſhment at Upſal, attending only his friends and the poor, he appears ever to have paid great attention to that noble and intricate ſcience. His lectures on medicine, dietetics, and the animal economy, were in high repute, nor is he at all behind-hand in commending his own abilities in this line. Though undoubtedly a great and ſagacious obſerver in every department of nature, he was in this ſomewhat too theoretical. If, however, he had peculiar ideas reſpecting the prevalence of the number five, his hypotheſes in general roſe much above the dull level of the humoral pathology in which he was educated; and when he applies his own didactic talents to illuſtrate medical theories, or any thing elſe, he is always ingenious, and as luminous as the ſubject will allow. His curious little *Clavis Medicinæ*, publiſhed in 1766, and his *Genera Morborum*, which appeared three years before, are not only ſtriking, but inſtructive. His idea of a ſyſtematic arrangement of diſeaſes by technical characters, was followed up and illuſtrated on a large ſcale, by his friend Sauvages of Montpellier; and the celebrated Dr. Cullen of Edinburgh, juſtly attributed to the Swediſh philoſopher the foundation of his own performance in this line. Such ſchemes of arrangement indeed can be conſidered merely as helps to the memory, and in themſelves altogether artificial. The abilities of Linnæus appear to the greateſt advantage in his claſſification of natural objects. He excelled in a happy perception of ſuch technical characters, as brought together things moſt naturally allied. Thus his ſexual diſtribution of plants, though profeſſedly artificial, is in many parts as natural as any that pretends to be ſo. Linnæus, moreover, was the firſt who perceived and declared the diſtinction between a natural and an artificial botanic ſyſtem, and he has laboured at the one as much as at the other. His lectures on the natural orders of plants were publiſhed, long after his death in 1792, from the notes of his pupils Giſeke and Fabricius, at Hamburgh. They evince his deep conſideration of a ſubject, then in the infancy of cultivation, the intricacy of which may well excuſe the frequency of error in the detail. In the zoological department, it is but juſtice to obſerve, that his claſſifications of birds and inſects are the moſt original as well as the beſt of the whole. In the former, as in the *Mammalia*, the organs of feeding lead the way to the moſt natural diſtinctions poſſible; but the author of this ſyſtem, which no one has yet attempted to ſuperſede, was well aware that the ſame principle would not hold good throughout, particularly with reſpect to inſects, whoſe deſtination, in their perfect ſtate, is not ſo much to take food, as to propagate their ſpecies. The mouth and its appendages are therefore, in this tribe, but of far ſubordinate conſequence; and Linnæus had recourſe to the more natural, as well as far more eaſy principles, deducible from the chief peculiarities of theſe animals, the differences in their wings, their ſtings, and their *antennæ*. His pupil Fabricius, for this reaſon, however able and ingenious in entomology, cannot be conſidered as fortunate or philoſophical, in applying his great preceptor's ſcheme of arrangement of quadrupeds and birds to inſects. Indeed, thoſe who have followed Fabricius in the detail of this ſtudy, declare, that he has rarely proceeded on his own plan, but, leaving the mouth in moſt caſes unexamined, has truſted to habit and general configuration, which certainly produce natural aſſemblages enough, and true to the Linnæan rules, but different from his own. The arrangement of fiſhes, by the relative poſition of their ventral fins, was a no leſs happy and original idea of the Swediſh naturaliſt; as pointing out their leading differences of form and habit, by a diſtinctive character, taken from a peculiar organ of their own. Shells he was long before he would ſtudy minutely at all, conſidering them merely as the houſes of particular animals, the knowledge of whoſe ſtructure and economy was, in a great meaſure, inacceſſible. At length, however, the uniformity of his plan obliged him to claſs theſe popular objects of admiration, in ſome way or other, and he has ſucceeded at leaſt as well as any of his fellow-labourers; though we are by no means inclined to juſtify ſome of his terms, which are borrowed from an anatomical analogy, not only falſe in itſelf, but totally exceptionable. This leads us to conſider a charge, often brought againſt this great man, of pruriency of phraſeology in many parts of his works. The moſt attentive contemplation of his writings has ſatisfied us that in ſuch inſtances he meant purely to be anatomical and phyſiological, and if his fondneſs for philoſophical analogies ſometimes led him aſtray, it was not in purſuit of any thing to contaminate his own mind, much leſs that of others. "Some of the deſcriptions of Linnæus," ſays a noble botanical author, "would make the moſt abandoned perſon bluſh." His lordſhip ought to have added, "*none but* the moſt abandoned." That the mind of Linnæus was ſimple and chaſte, as his morals were confeſſedly pure, is evinced by his Lapland Tour, written only for his own uſe, but which is now, as we have already mentioned, before the public. This is ſuch a picture of his heart, as will ever render any juſtification of his moral character, and any elaborate diſplay of his religious principles or feelings, alike ſuperfluous.

His apparent vanity, as diſplayed in his diary, publiſhed in Dr. Maton's valuable edition of Dr. Pulteney's *View of his Writings*, is perhaps far leſs juſtifiable. All we can ſay for him is, that this paper was drawn up for the uſe of his intimate friend Menander, as materials from which his life was to be written. If it be unbecoming, and indeed highly ridiculous in many inſtances, for a man to ſpeak as he does of himſelf, the juſtice and accuracy of his aſſertions, had they come from any other perſon, could in no caſe be diſputed.

As the habits of Linnæus were temperate and regular, he retained his health and vigour in tolerable perfection, notwithſtanding the immenſe labours of his mind till beyond his 60th year, when his memory began in ſome degree to fail him. In 1774, at the age of 67, an attack of apoplexy greatly impaired his conſtitution. Two years afterwards a ſecond attack rendered him paralytic on the right ſide, and materially affected his faculties. The immediate cauſe of his death, which happened January 10th, 1778, in the 71ſt year of his age, was an ulceration of the bladder. His remains were depoſited in a vault near the weſt end of the cathedral of Upſal, where a monument of Swediſh porphyry was erected by his pupils. His obſequies were performed, in the moſt reſpectful manner, by the whole univerſity, the pall being ſupported by ſixteen doctors of phyſic, all of whom had been his pupils. A general mourning took place on the occaſion at Upſal. His ſovereign, Guſtavus III. commanded a medal to be ſtruck, expreſſive of the public loſs, and honoured the Academy of Sciences at Stockholm with his preſence, when the eulogy of this celebrated man was pronounced there by his intimate friend Bäck. A ſtill higher compliment was paid to his memory by the king in a ſpeech from the throne, wherein his majeſty publicly celebrated the talents of his deceaſed ſubject, and lamented the loſs which his country had ſo recently ſuſtained. Various teſtimonies of reſpect were given to the merits of Linnæus in the different parts of Europe, even where rival ſyſtems or intereſts had heretofore triumphed at his expence. The celebrated Condorcet delivered an oration in his praiſe to the Pariſian Academy of Sciences, which is printed in its memoirs. We cannot wonder that his memory was cheriſhed in England, where he had long had numerous correſpondents, and where two of his moſt diſtinguiſhed pupils, Solander and Dryander, have, in their own talents and character, conferred ſingular honour upon their preceptor. Ten years after his deceaſe a new ſociety of naturaliſts, diſtinguiſhed by his name, was founded in London, and has ſince been incorporated by royal charter, whoſe publications, in ten quarto volumes of Tranſactions, ſufficiently evince that its members are not idle venerators of the name they bear. This name, in imitation of them, has been adopted by ſeveral ſimilar inſtitutions in other parts of the world.

The appellation of Linnæan Society was, with the more propriety, choſen by this Britiſh inſtitution, on account of the muſeum of Linnæus having fallen into the hands of its original projector, and hitherto only preſident. This treaſure, comprehending the library, herbarium, inſects, ſhells, and all other natural curioſities, with all the manuſcripts and whole correſpondence of the illuſtrious Swede, were obtained, by private purchaſe from his widow, after the death of his ſon in 1783. The authority which ſuch an acquiſition gave to the labours of the infant ſociety, as well as to all botanical and zoological publications, the authors of which have ever been allowed freely to conſult it, will readily be perceived. Nothing perhaps could have more contributed to raiſe up, or to improve, a taſte for natural ſcience, in any country.

Linnæus had by his wife Sarah Elizabeth, who ſurvived to extreme old age, two ſons and four daughters. His eldeſt ſon Charles ſucceeded him in the botanical profeſſorſhip; ſee the next article. The younger, John, died March 7, 1757, in the third year of his age. The marriage of his eldeſt daughter, Elizabeth Chriſtina, we have already mentioned. This lady is recorded as having diſcovered a luminous property in the flowers of the Naſturtium, *Tropæolum majus*, which are ſometimes ſeen to flaſh like ſparks of fire in the evening of a warm ſummer's day. Of the other daughters we know nothing materially worthy of record. The late Daniſh Profeſſor Vahl is reported, when a ſtudent, to have made an impreſſion on the heart of the youngeſt, which her father did not think proper to countenance, and which is ſuppoſed to have prevented his ſhewing that favour and encouragement to the young Dane, which his acuteneſs and zeal in botanical ſtudies certainly deſerved. Linnæus's Diary, publiſhed by Dr. Maton, with another in MS. of the early part of his life. Stoever's Life of Linnæus by Trapp. Aikin's General Biography. Various works of Linnæus. S.

LINNÆUS, or VON LINNÉ, CHARLES, the eldeſt, and only ſurviving, ſon of the preceding, was born January 20, 1741, at the houſe of his maternal grandfather at Fahlun. His father was anxiouſly deſirous of his excelling in natural hiſtory, more particularly botany, and after endeavouring, from his moſt tender years, to make him fond of flowers, committed him, when about the age of nine or ten, to the more particular care of ſome of his own moſt favourite pupils. By them he was taught the names of the plants in the Upſal garden, and ſuch of the principles of natural ſcience as were ſuited to his period of life, as well as to converſe habitually in Latin. He proved a docile and ready ſcholar, and appears to have given ſatisfaction to his father, who procured for him, at the age of eighteen, the appointment of Demonſtrator in the botanic garden, an office then firſt contrived on purpoſe for him. Having learned to draw from nature, he became an author at the age of twenty-one, publiſhing in 1762 his firſt *Decas Plantarum Rariorum Horti Upſalienſis*, the plates of which, in outline only, like thoſe of Plumier, were drawn by his own hand. Theſe are ſufficiently faithful and uſeful, if not ornamental. The deſcriptions are full and ſcientific. In 1763 another *Decas*, or collection of ten ſpecies, came out on the ſame plan. Whether the Upſal bookſellers did not encourage him to proceed, or for what other reaſon we know not, he never printed any more numbers under this title. In 1767 however, he publiſhed at Leipſic ten more plates and deſcriptions, like the above, entitled *Plantarum Rariorum Horti Upſalienſis Faſciculus Primus*. To this he was perhaps inſtigated by his friend Schreber, who, the year before, had given to the world a ſimilar work, deſcribing ten rare oriental plants, drawn by himſelf. But neither of theſe publications was ever extended to a ſecond *Faſciculus*. In 1763 he was nominated adjunct Profeſſor of Botany, with a promiſe, hitherto unexampled, that after his father's death, he ſhould ſucceed to all his academical functions. In 1765 he took his degree of Doctor of Phyſic, and began to give lectures.

His progreſs would probably have been happy, if not brilliant, but domeſtic chagrin ſapped the foundation of all his felicity, and damped his ardour in every purſuit. This aroſe from the conduct of his unnatural mother, another example of that rare and deteſtable depravity exhibited by the mother of Savage the poet. Not content with diſhonouring her huſband's bed, and making his home as uncomfortable as ſhe could, by the meaneſt parſimony and diſguſting petty tyranny, the wife of the great Linnæus conceived a hatred for her only ſon, which ſhe diſplayed by every affront and perſecution that her ſituation gave her the means of inflicting on his ſuſceptible and naturally amiable mind. According to Fabricius, ſhe forced her huſband, who by ſuch a conceſſion ſurely partook largely of her guilt and meanneſs, to procure the nomination of his pupil Solander to be his future ſucceſſor, in preference to his own ſon, and it was a part of her plan that he ſhould marry her eldeſt daughter. Solander, however, diſdained both the uſurpation and the bait, refuſing to leave England; and the miſguided father recovered his ſenſes and authority, cauſing his ſon, as we have ſaid above, to receive this truly honourable diſtinction. The mind and ſpirit of the young man nevertheleſs ſtill drooped, and even when he had attained his thirtieth year, he would gladly have eſcaped from his miſeries and his hopes together. The authority of the king was obliged to be exerted, at his father's ſolicitation, to prevent his going into the army. This meaſure of the parent was happily followed up by kindneſs and encouragement in his botanical purſuits, to which treatment the ſon was ever ſenſible, and he revived from his deſpondency before his father's death, which happened when he was thirty-ſeven years of age.

Though obliged by his mother to purchaſe, at her own price, the library, manuſcripts, herbarium, &c. which he ought by every title to have inherited, he roſe above every impediment, and betook himſelf to the uſeful application of the means now in his hands, for his own reputation and advancement. His father had already prepared great part of a third botanical Appendix, or *Mantiſſa*; from the communications of Mutis, Kœnig, Sparmann, Forſter, Pallas, and others. To this the younger Linnæus added thoſe of Thunberg from the Cape, which his father, "with half-extinguiſhed eyes," as Condorcet beautifully relates, had juſt been able to glance over, but not to deſcribe. Hence originated the *Supplementum Plantarum*, printed at Brunſwick, under the care of Ehrhart in 1781. The ingenious editor inſerted his own new characters of ſome genera of Moſſes; which Hedwig has ſince confirmed, except that ſome of the names have been juſtly rejected. This ſheet was, in an evil hour, ſuppreſſed by the mandate of Linnæus from London, where, at that period, the ſubject of generic characters of moſſes was neither ſtudied nor underſtood, whatever ſuperior knowledge was diſplayed concerning their ſpecies. The plants of the *Supplementum* are admitted into the fourteenth edition of the *Syſtema Vegetabilium* by Murray, and figures of ſome of the moſt curious have been publiſhed by the writer of this preſent article, in his *Plantarum Icones ex Herbario Linnæano.* Three botanical diſſertations alſo appeared under the preſidency of the younger Linnæus, on Graſſes, on *Lavandula*, and the celebrated *Methodus Muſcorum*, which laſt was the work, and the inaugural theſis, of the preſent Profeſſor Swartz of Stockholm. Theſe form a ſequel to the 186 ſimilar eſſays, which moſt of them compoſe the ſeven volumes of the *Amoenitates Academicæ*, the reſt being publiſhed by Schreber in three additional ones.

The ſubject of our memoir had always felt a ſtrong deſire to viſit the chief countries of learned and civilized Europe. For this purpoſe he was obliged to pawn his juvenile herbarium, made from the Upſal garden, to his friend Alſtroemer, for the loan of about fifty or ſixty pounds. He arrived at London in May 1781, and was received with enthuſiaſm by the ſurviving friends and correſpondents of his father, and was in a manner domeſticated under the roof of ſir Joſeph Banks, whoſe friendſhip, kindneſs, and liberality could not be exceeded; neither could they have been by any one more gratefully received. Here the ardent Swediſh viſitor had every aſſiſtance for the preparation of ſeveral works on which he was intent, as a ſyſtem of the *Mammalia*, a botanical treatiſe on the Lily and Palm tribes, and new editions of ſeveral of his father's ſtandard books. None of theſe however have yet been printed. An attack of the jaundice rendered half his ſtay in England uncomfortable as well as uſeleſs to him. He proceeded to Paris in the latter end of Auguſt 1781, accompanied by the amiable and celebrated Brouſſonet, with whom he became acquainted at London. His reception in France was not leſs flattering than what he had experienced in England. He was enriched with duplicates of Commerſon's plants from the herbarium of the excellent Thouin, which amounted to about 1100 ſpecies, and had never been communicated to any other foreigner. In the following ſpring he viſited Holland, tracing with filial piety every veſtige of his father's ſteps at Hartecamp and elſewhere, and receiving, as he had done at Paris and London, ample contributions for his herbarium, library, and muſeum of ſhells and inſects. The next place in which he made any ſtay was Hamburgh, where ſeveral of his own friends were already ſettled, and from hence he returned by Copenhagen and Stockholm, viſiting his friend Fabricius at Kiel, and his patron Baron

Alſtroemer at Gottenburgh, finally arriving at Upſal in February 1783. In his progreſs he had received ſeveral academical honours, as well as ample teſtimonies of ſcientific and perſonal reſpect, being a man of agreeable and unaſſuming manners, without vanity or oſtentation, though ſomewhat, perhaps not unduly, tenacious, that his own diſcoveries and performances ſhould not be confounded with any thing left behind by his father. But the career of this excellent man was cut ſhort by a bilious fever, which concluded with a ſtroke of apoplexy, November 1, 1783, in the forty-ſecond year of his age. His remains were interred with great ſolemnity on the 30th of the ſame month. His coffin was laid by the ſide of his father, and as the male line of the family concluded in him, their coat of arms was broken over the grave. After this ceremony the gardener of the univerſity ſtrewed flowers over the mingled aſhes of the father and the ſon. A funeral oration in Swediſh was pronounced by M. Von Schulzenheim, and was ſoon after publiſhed. This compoſition, partly tranſlated, and much enlarged, in the Engliſh edition by Trapp of Stoever's Life of Linnæus, has afforded much of the ſubſtance of this article, aſſiſted by ſeveral private communications.

The younger Linnæus is ſaid to have had naturally a ſtrong and vigorous frame of body, and to have inherited his father's keen and penetrating eyes, as well as his temper and active diſpoſition. He was greatly beloved by thoſe who knew him, and died generally reſpected and lamented. His muſeum and library reverted to his mother and ſiſters, as he had never been married; and the former inſtantly fixed her eyes on ſir Joſeph Banks, as the moſt likely perſon to purchaſe theſe relics at the high price, as ſhe thought it, of a thouſand guineas. On his refuſal, and by his kind recommendation and advice, they came into the hands where they now are. The ſale was precipitated before the return of the king of Sweden, then on his travels, leſt he ſhould oblige the heirs to diſpoſe of the whole at a cheaper rate to the Univerſity of Upſal. This would actually have been the caſe, as appears from the exertions made by his Majeſty on his return, who ſent a courier to the Sound, and a veſſel by ſea, to intercept the ſhip that was bearing away the prize. S.

LINNET, Linaria, in *Ornithology*, the denomination of a tribe of birds, which ſome authors have made a diſtinct genus, comprehending ſeveral ſpecies, which are uſually claſſed under the genus *Fringilla*. Thoſe who conſider them as a diſtinct genus, ſtate their characters to be theſe: the birds of it are ſomewhat ſmaller than the chaffinch; their general colour is a greyiſh-brown; their tail is a little forked, the outer feathers of it having white extremities; and they all ſing very ſweetly. We have in England four ſpecies of this bird.

1. The common brown linnet, the *Fringilla linota* of Gmelin, well known to every one. Theſe birds are much eſteemed for their ſong: they feed on ſeeds of different kinds, which they peel before they eat: the ſeed of the *linum*, or flax, is their favourite food, whence the name of the linnet tribe. See Fringilla *Linota*.

2. The *linaria rubra major*, or greater red-headed linnet, or greater redpole; the *Fringilla cannabina* of Linnæus. This has a fine red head, a grey neck, a duſky reddiſh-brown back, and its breaſt and belly are ſomewhat reddiſh. The female of this ſpecies, however, has no redneſs in its head or breaſt, but has ſomewhat of a greeniſh caſt on the brown of its back, and is yellowiſh on the breaſt, with ſome browniſh ſpots. It is a common fraud in the bird-ſhops in London, when a male bird is diſtinguiſhed from a female by a red breaſt, as in the caſe of this bird, to ſtain or paint the feathers, ſo that the deceit is not eaſily diſcovered, without cloſe inſpection. This ſpecies of linnet is frequent on our ſea-coaſts, and is often taken in flight time near London. It is a familiar bird, and becomes cheerful in five minutes after it is caught.

3. The *linaria rubra minor*, or leſſer red-headed linnet, or leſſer redpole; the *Fringilla linaria* of Linnæus. This is the leaſt of all the linnets, and on the back is of the ſame colour with the common linnet; the back part of its head is red, and alſo its breaſt, but the lower part of its belly is whitiſh. In this ſpecies, the female, as well as the male, has a red head, that of the male being ornamented with a rich ſhining ſpot of a purpliſh-red, and that of the female of a ſaffron colour; and both have their beaks much ſharper, and their feet and legs blacker than in the larger kind. This is a gregarious bird, whereas the larger ſpecies commonly flies ſingle. This ſeems to be the ſpecies known about London by the name of ſtone redpole.

4. The laſt ſpecies is the *linaria montana*, or *Fringilla montium*, or mountain linnet. This is the largeſt of all the linnets, according to Willughby's deſcription, though Mr. Pennant ſays that it is in ſize rather inferior to the common linnet. Its beak is very ſmall; its head and back are of the ſame colour with thoſe of the common linnet, and the feathers of its breaſt and belly are black, edged with white; the rump of the male is of a fine and beautiful red, and thus diſtinguiſhes it from the female. This ſpecies is common in Derbyſhire, but ſeems not ſo frequent in other places. However, it is taken in the flight ſeaſon near London with the linnets, and called a *twite*. It breeds, according to Mr. Pennant, only in the northern parts of our iſland. Ray and Pennant.

It is remarkable of the linnet, that when it builds in hedges, and when in furze-buſhes on heaths, in both which places the neſts are very common, they are made of different materials. When they build in hedges, they uſe the ſlender filaments of the roots of trees, and the down of feathers and thiſtles; but when they build in heaths, they uſe moſs, principally, for the outer part, finiſhing it within with ſuch things as the place will afford, chiefly with wool and hair. Theſe birds will have young ones three or four times a year, eſpecially if they are taken away before they are able to leave the neſts. They lay five whitiſh eggs, ſpotted like thoſe of the gold-finch.

When they are intended to be taught to whiſtle tunes, or to imitate the notes of any other bird, they are to be taken from the old ones when they are not more than four days old; for at this time they have no idea of the notes of the old ones, and will readily be taught to modulate their voice like any thing that is moſt familiar to their ears, and within the compaſs of their throats. The honourable Mr. Barrington obſerves, that in order to be certain that a neſtling will not have the call of its ſpecies, it ſhould be taken from the neſt when only a day or two old; though a bird of this age requires great trouble in breeding, and the chance is greatly againſt its being reared. There requires more care in the feeding them when they are taken thus young, than when they are left in the neſt till nearly fledged, but they will be reared very well upon a food half bread and half rapeſeed, boiled and bruiſed: this muſt be given them ſeveral times a day. It muſt be made freſh every day, and given them ſufficiently moiſt, but not in the extreme. If it be in the leaſt ſour, it gripes and kills them; and if too ſtiff, it is as miſchievous, by binding them up.

They muſt be hung up as ſoon as taken from the neſt, under the bird whoſe note they are intended to learn; or if they are to be taught to whiſtle tunes, it muſt be done by giving them leſſons at the time of feeding; for they will profit more while young in a few days, than in a long time afterwards, and will take in the whole method of their notes before they are able to crack hard ſeeds. Some have attempted to teach them to ſpeak, in the manner of the parrot, or other birds, and they will arrive at ſome ſort of perfection in it with great pains.

Mr. Barrington mentions a linnet, which being taken from its neſt when only two or three days old, almoſt articulated the words *pretty boy*, as well as ſome other ſhort ſentences. See SONG *of Birds*.

LINNICK, in *Geography*, a town of France, in the department of the Roer, and chief place of a canton, in the diſtrict of Aix-la-Chapelle, ſeated on the Ruhr; five miles N.N.W. of Juliers. The place contains 2086, and the canton 13,589 inhabitants. N. lat. 50° 57′. E. long. 6° 13′.

LINOCARPUM, in *Botany*, ſo called by Micheli, Nov. Gen. 22. t. 21, from the reſemblance of its fruit to that of *Linum*, Flax. See RADIOLA and LINUM.

LINOCIERA, a name given by Dr. Swartz, in honour of Geoffrey Linocier, a French phyſician, who flouriſhed at the cloſe of the ſixteenth and beginning of the ſeventeenth centuries. He publiſhed at Paris in 1584 an account of the officinal aromatics of the Eaſt and Weſt Indies. This book is accompanied by wooden cuts. Linocier alſo wrote upon the natural hiſtory of beaſts, birds, fiſhes, and ſerpents; but on theſe ſubjects he borrowed largely from Geſner and other authors. The preſent genus was adopted by Schreber, from Swartz, who firſt called it *Thouinia*, in his *Prodromus*. Dr. Smith however ſuggeſts that *Linociera* may probably not be a diſtinct genus from *Chionanthus*, merely becauſe they differ in the number of cells of the fruit: the former having two cells, the latter only one. But in ſome genera of this natural order, the number of cells in the ripe fruit has been diſcovered conſtantly to be fewer than in the young germen. In *Olea*, in particular, this was found to be regularly the caſe by the late M. Brouſſonet, though we know not that it had been before ſuſpected.—Swartz Ind. Occ. v. 1. 49. Schreb. 784. Willd. Sp. Pl. v. 1. 154. (Thouinia; Swartz Prod. 14.)—Claſs and order, *Diandria Monogynia*. Nat. Ord. *Sepiariæ*, Linn. *Jaſmineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, very ſmall, four-toothed, obtuſe, permanent. *Cor.* Petals four, equal, linear, channelled, erect, ſpreading at the top, conſiderably longer than the calyx. *Stam.* Filaments two, very ſhort and broadiſh; anthers linear, two-furrowed, the length of the corolla, erect, each adhering ſlightly to one ſide of two of the petals. *Piſt.* Germen ſuperior, ovate, quadrangular; ſtyle ſhort; ſtigma oblong, cloven. *Peric.* Berry, or rather Drupa, ovate, acuminate, of two cells. *Seeds* ſolitary, oblong.

Eſſ. Ch. Calyx four-toothed. Corolla of four petals, the two oppoſite ones connected at their baſe by the anthers. Fruit of two cells and two ſeeds.

L. *liguſtrina* is the only ſpecies deſcribed by Swartz. It is a native of dry open places in the Weſt Indies, eſpecially Jamaica and St. Domingo, flowering in June and July.

LINONASME, the name of a melancholy and ſolemn air of the ancient Greeks, on the death of Linus.

LINOS is ſuppoſed to imply the ſame air. Rouſſeau, however, calls it a kind of ruſtic ſong among the ancient Greeks; they had likewiſe a funeral ſong of the ſame name, which anſwered to what the Romans called Nænia. Some ſay that the Linos was invented in Egypt; while others aſcribe its invention to Linus, the Eubœan.

LINOSA, in *Geography*, a ſmall iſland in the Mediterranean, not far from the coaſt of Tunis, near the iſland of Lampedoſa.

LINOTA, in *Ornithology*. See LINNET, and FRINGILLA *Linota*.

LINOZOSTIS, in *Botany*, a name given by the ancient Greek writers to two plants very different from one another; the one is the *mercurialis*, or Engliſh mercury, a plant common in uncultivated places, and eaten by many boiled in manner of aſparagus; the other the *epilinum*, or dodder, growing upon the plants of flax.

Theophraſtus, Dioſcorides, and the ancient Greeks, uſe the word in the firſt ſenſe, and the modern Greeks in the latter.

The Latin authors call this *linozoſtis*, or *epilinum*, ſometimes *angina lini*; and *podagra lini*, looking on it as a diſeaſe which choaks the plant it grows on, and cauſes gouty tumours on the ſtalks. See DODDER.

LINQUES, in *Geography*, a country of Celebes, lying between the two ſtates of Binano and Bankale, not far from the bay of *Tourattea*; which ſee.

LINSCHOTTEN, a town of Holland; eight miles W. of Utrecht.

LINSDORF, a town of Bohemia, in the circle of Konigingratz; 32 miles E.S.E. of Geverſberg.

LINSE, a town of Pruſſia, in Oberland; 15 miles S.E. of Marienwerder.

LINSEED, or LINE-SEED, a ſort of grain, being the ſeeds of the common *flax*, (which ſee,) which enters the compoſition of ſeveral medicines, and yields, by expreſſion, an oil, that has moſt of the qualities of nut oil, and is according generally uſed, in lieu thereof, in painting, and for burning.

Thoſe who manufacture it in large quantities have mills turned by horſes or water, for the more expeditious diſpatch of their work. See OIL.

LINSEED, in the *Materia Medica*. Theſe ſeeds have an unctuous mucilaginous ſweetiſh taſte, without any remarkable ſmell. The oil which they yield in expreſſion, when carefully drawn without the application of heat, has no particular taſte or flavour: and in ſome properties differs conſiderably from moſt other oils of this kind; as congealing in water, not forming a ſolid ſoap with fixed alkaline ſalts, acting more powerfully as a menſtruum on ſulphurous bodies, than any other expreſſed oil that has been tried.

The ſeeds, boiled in water, yield a large proportion of a ſtrong flavourleſs mucilage; but to rectified ſpirit they give out little or nothing. Theſe ſeeds have been ſometimes uſed, in a ſeaſon of ſcarcity, inſtead of grain; but they appear to be an unwholeſome as well as an unpalatable food. They afford little nouriſhment, impair the ſtomach, and produce great flatulence, as Galen long ago obſerved. Tragus relates, that thoſe who fed upon them in Zealand, had the hypochondres in a ſhort time diſtended, and the face and other parts ſwelled; and that not a few died of theſe complaints.

Infuſions and decoctions of theſe ſeeds, like other vegetable mucilages, are uſed as emollients or demulcents in hoarſeneſſes, coughs, and pleuritic ſymptoms, which frequently prevail in catarrhal affections; they are alſo recommended in nephritic pains and ſtranguries; a ſpoonful of the ſeeds unbruiſed is ſaid, for theſe purpoſes, to be ſufficient for a quart of water. The ſeeds are alſo much uſed externally in emollient and maturating cataplaſms. The ſeeds from which the oil has been expreſſed, boiled in milk, and applied warm, on a cloth, to herniæ, are much recommended in in the Satyr. Sileſiac. Specim. 4. Obſ. 4. The expreſſed oil is an officinal preparation, and is ſaid to be of a more healing and balſamic nature than the other oils of this claſs; it has therefore been very generally employed in pulmonary complaints; alſo in colics, and conſtipations of the bowels. It is uſed in common with other oils as a vermifuge. Lewis Mat. Med. Woodv. Med. Bot.

Linseed *Cakes*, in *Agriculture*, the name of ſuch cakes as remain after the expreſſion of the oil from flax ſeed. They are at preſent much uſed in the fattening of cattle, ſheep, and other ſorts of live ſtock, and of courſe of great value and importance to the farmer. The price however has been of late ſo high as to greatly leſſen the demand for this article. See Oil-cake.

Linseed, *Infuſion of*. See Infusion.

LINSELLES, in *Geography*, a town of France, in the department of the North; five miles N. of Lille.

LINSENBAHRT, or as he is called in his works in Latin, Lentilius, Rosinus, in *Biography*, a phyſician, was born at Waldenburg, in the province of Hohenlohe, in February 1657. He commenced his ſtudies at Heidelberg at the age of fourteen, and thence removed to Jena in 1673. But his ſcanty means of ſubſiſtence compelled him the next year to engage as a teacher in the vicinity of Leipſic, where he continued till 1677. He then travelled, with a view to improve his ſituation, through ſeveral of the principal towns in the north of Germany, and ſettled at Mittau, in Courland, in the ſame capacity of teacher. To aid this feeble reſource, Linſenbahrt began likewiſe to practiſe medicine, in which his ſucceſs was ſuch, that the marquis of Anſpach appointed him phyſician to the town of Creilſheim, in Franconia; whither he repaired in 1680, after having been admitted a licentiate in medicine at Altdorf. He afterwards ſettled at Stutgard, and was patroniſed by the marquis of Dourlach; and, when that prince was driven by the war to take refuge at Baſle, he was nominated honorary phyſician to the duke of Wirtemberg, and became his firſt phyſician in 1711. He accompanied the ſon of this prince in his travels, during three years; and after his return, in 1716, remained in the tranquil exerciſe of his profeſſion until his death, in February 1733. Linſenbahrt was ardent in his attention to the qualities and operations of drugs during his whole life, regarding that ſpecies of knowledge as the moſt important to the phyſician, and being ſomewhat too negligent of the ſtudy of anatomy, and of the writings of the ancients. He was the firſt who recommended the uſe of arſenic internally, for the cure of intermittent fevers, in which its efficacy has been eſtabliſhed by recent obſervers, and eſpecially by Dr. Fowler, of York. He was a decided enemy to blood-letting, which he ſtrenuouſly endeavoured to diſcard from the practice of medicine; and particularly condemned the cuſtom, then prevalent among the Germans, of letting blood at the equinoctial periods, againſt which he publiſhed a treatiſe in his mother-tongue, at Ulm, in 1692. He was likewiſe author of the following works. "Tabula Conſultatoria Medica," Ulm, 1696. "Miſcellanea Medico-Practica tripartita," ibidem, 1694. "De Hydrophobiæ cauſâ et cura, Diſſertatio," ibid. 1770. "Eteodromus Medico-Practicus anni 1709," Stutgard, 1711. "Jatromnemata Theoretico-Practica," ibid. 1712. Eloy Dict. Hiſt. de la Med.

LINSPINS, or Linchpins, are ſmall pins of iron, which keep the wheel of a cannon, or waggon, on the axle-tree; for when the end of the axle-tree is put through the nave, the linſpin is put in to keep the wheel from falling off.

LINSTOCK, a ſhort ſtaff of wood, about three feet long, having at one end a piece of iron divided into two branches, each of which has a notch to hold a piece of match, and a ſcrew to faſten it there; the other end being alſo ſhod with iron, and pointed to ſtick into the ground, or in the deck when it is uſed at ſea. It is uſed by the gunners in firing-cannon. It is frequently uſed in ſmall veſſels, in an engagement, where there is commonly one fixed between every two guns, by which the match is always kept dry and ready for firing.

LINSTORP, in *Geography*, a town of Sweden, in the province of Medelpedia; 16 miles N. of Sundſwal.

LINT, in *Surgery*, is the ſcraping of fine linen, uſed by ſurgeons in dreſſing wounds. It is made into various forms, which acquire different names, according to the difference of their figures.

Lint made up in an oval, or orbicular form, is called a *pledgit*; if in a cylindrical form, or in the ſhape of a date olive-ſtone, it is called a *doſſil*.

Theſe different forms of lint are required for many purpoſes; as, 1. To ſtop blood in freſh wounds, by filling them up with dry lint before the application of a bandage; though if ſcraped lint be not at hand, a piece of fine linen may be torn into ſmall rags, and applied in the ſame manner. In very large hemorrhages the lint, or rags, ſhould be firſt dipt in ſome ſtyptic liquor, alcohol, or oil of turpentine, or ſprinkled with a ſtyptic powder. 2. To agglutinate and heal wounds; to which end lint is very ſerviceable, if ſpread with ſome digeſtive ointment, or balſam, or dipt in ſome vulnerary liquor. 3. In drying up wounds and ulcers, and forwarding the formation of a cicatrix. 4. In keeping the lips of wounds at a proper diſtance, that they may not haſtily unite, before the bottom is well digeſted and healed. 5. They are highly neceſſary to preſerve wounds from the injuries of the air. Small portions of lint tied round with thread are chiefly uſed in dreſſing wounds and ulcers of the deeper kind. They are always applied to the bottom of ſuch wounds, the remaining cavity being filled up with other portions of lint. By this means, the immediate removal of the dreſſings is not only provided for, but the poſſibility of leaving any part of them in the bottom of the wound is prevented.

In very large wounds, and eſpecially in amputations of the limbs, which operations are frequently required in the army and navy, at times when lint is very ſcarce, it will be very ſufficient to dreſs the bare bone and face of the wound with ſcraped lint, filling up the cavity with tow, and covering all with a large compreſs.

Surgeons of former ages formed compreſſes of ſponge, feathers, wool, or cotton, linen being ſcarce; but lint is far preferable to all theſe, and is at preſent univerſally uſed.

LIN-TCIN, in *Geography*, a city of China, of the ſecond rank, in Chan-tong, on the grand canal, much frequented by veſſels as a magazine for all ſorts of merchandize. N. lat. 36° 56′. E. long. 115° 31′.

LINTEL, in *Architecture*, the piece of timber which lies horizontally over door-poſts and window-jambs; as well to bear the thickneſs of the wall over it, as to bind the ſides of the walls together.

LINTELN, in *Geography*, a town of Germany, in the county of Verden; four miles N.E. of Verden.

LINTERNUM, or Liternum, in *Ancient Geography*. See Liternum.

LINTHAL, in *Geography*, a town of Switzerland, in the canton of Glaris; 12 miles S.W. of Glaris.

LIN-TIN, a town of China, of the ſecond rank, on a ſmall iſland in the province of Quang-tong; 15 miles N.E. of Macao.

LINTNER, in *Biography*, an excellent performer on the German flute at Berlin, in 1772, a diſciple of the late Frederic II. king of Pruſſia's flute-maſter, Quantz.

LINTON, in *Geography*, a ſmall market town in the hundred of Chilford, Cambridgeſhire, England, is ſituated ten miles from Cambridge, and forty-ſix from London. The town conſiſts of ſeveral irregular ſtreets, the chief of which is about half a mile in length; the houſes are principally low and covered with thatch; ſome however are of brick, and neatly built. The church is a ſpacious ſtructure, and built with flints, intermixed with ſtone and plaſter. It conſiſts of two aiſles, a nave, a chancel, and a large tower. It contains ſeveral monuments and ſepulchral memorials, among which is a handſome mural monument by Wilton, to the memory of Mrs. Elizabeth Bacon, and her brother Peter Sandley, eſq. A Sunday ſchool was recently eſtabliſhed in this town by the exertions of the Rev. Mr. Fiſher, the vicar; it now affords tuition to upwards of an hundred children. A market, principally for corn, is held on Thurſdays; it was originally on Tueſdays, and was granted in the year 1245, with an annual fair for three days. The fair has been diſcontinued, but two others have been eſtabliſhed; one for ſheep, and one principally for hiring harveſt men. In the reign of Edward III. there was an alien priory at Linton, ſubordinate to the abbey of St. Jacutus de Inſula in Brittany; being ſeized for the king in the reign of Henry V., it was given by his ſucceſſor to the maſter and fellows of Pembroke hall, Cambridge. At Barham alſo, in this pariſh, was a priory of Crutched Friars, ſo early as the year 1292; the ſcite was granted by Henry VIII. to Philip Pariſh, eſq. and afterwards to John Millecent, eſq. who was before poſſeſſed of the manor. In the Millecents the priory and manor continued till the year 1740, when John Millicent, eſq. the laſt of the family, died; his widow, afterwards married to the Rev. C. Lonſdale, left her eſtates to the maſter and fellows of Pembroke hall. Barham hall, Mrs. Lonſdale's ſeat, appears to have been formed out of the conventual buildings: the hall, chapel, and cloiſters, ſtill remain: it was appropriated, by Mrs. Lonſdale's will, as a country ſeat for the maſter of Pembroke hall for the time being. In the population return to parliament in the year 1801, the pariſh of Linton was ſtated to contain 183 houſes, and 1157 inhabitants. Lyſons' Magna Britannia, vol. ii. Beauties of England and Wales, vol. ii.

LINTZ, a town and citadel of Germany, ſurrounded with an old wall, and ſituated on the E. ſide of the Rhine, containing about 600 houſes; 10 miles S.S.E. of Bonn. N. lat. 50° 34'. E. long. 7° 14'.—Alſo, a well-built and populous town of Auſtria, ſeated on the Danube; conſiſting of a ſingle ſtreet, with ſome annexed ſuburbs, in which is the ſovereign's citadel, ſituated on an eminence, commanding a fine proſpect. The trade of the town is conſiderable, and it has fairs that poſſeſs privileges under proper regulations, at Eaſter and St. Bartholomew's; 30 miles S.E. of Paſſau. N. lat. 48° 18'. E. long. 14° 15'.

LINTZENEGG, a town of Auſtria; 10 miles S. of Zwetl.

LINUFAR, in *Botany*, a name uſed by ſome of the writers of the middle ages, to expreſs the water-lily. The Arabians gave this genus of plants the name of *nilufar*, and this word *linufar* is only formed of that, by tranſpoſing ſome of the letters.

LINUM, in *Botany*, the λινον of Dioſcorides, Theophraſtus, and other ancient Greek authors, appears to be derived from λινεω, *to hold*, the fibres of this plant being ſo remarkable for their tenacity, that its herbage has always been in the greateſt eſtimation for the manufacture of linen cloth, whilſt its ſeeds by preſſure afford a valuable oil. (See FLAX.)—Linn. Gen. 153. Schreb. 206. Willd. Sp. Pl. v. 1. 1533. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 342. Prod. Fl. Græc. v. 1. 214. Ait. Hort. Kew. ed. 2. v. 2. 184. Tournef. t. 176. Juſſ. 303. Lamarck Illuſtr. t. 219. Gærtn. t. 112.—Claſs and order, *Pentandria Pentagynia*. Nat. Ord. *Gruinales*, Linn. *Caryophyllaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of five leaves, lanceolate, erect, ſmall, permanent. *Cor.* funnel-ſhaped; petals five, oblong, gradually broader towards the upper part, obtuſe, much ſpreading, large. *Stam.* Filaments five, awl-ſhaped, erect, the length of the calyx; (alſo five rudiments alternating with them) anthers ſimple, arrow-ſhaped. *Piſt.* Germen ſuperior, ovate; ſtyles five, thread-ſhaped, erect, as long as the ſtamens; ſtigmas ſimple, reflexed. *Peric.* Capſule globoſe, bluntly five-ſided, of ten cells and ten valves. *Seeds* ſolitary, ovate or flattiſh, acuminated, ſmooth.

Eſſ. Ch. Calyx five-leaved. Petals five. Capſule ſuperior, with ten valves and ten cells. Seeds ſolitary.

In the 14th edition of Linnæus's *Syſtema Vegetabilium* we meet with twenty-two ſpecies of *Linum*. Willdenow has twenty-nine, beſides which, four, not mentioned by him, occur in the *Hortus Kewenſis*, and one in the *Prodromus Floræ Græcæ*. But from the liſt is to be deducted *L. Radiola*, which is the *Radiola millegrana* of Dr. Smith's *Flora Britannica*, 202.—The genus is divided into two ſections, the firſt having alternate, the ſecond oppoſite, leaves.—Examples of the firſt ſection are

L. *uſitatiſſimum*. Common Flax. Linn. Sp. Pl. 397. Engl. Bot. t. 1357. Curt. Lond. faſc. 5. t. 22.—Calyx-leaves ovate, acute, three-nerved. Petals crenate. Leaves lanceolate, alternate. Stem moſtly ſolitary.—Not unfrequent in fields throughout the more temperate parts of Europe, in conſequence probably of its being a plant of ſuch general cultivation, flowering in July. *Root* annual, fibrous, ſmall. *Stem* erect, round, ſmooth, leafy. *Leaves* entire, three-nerved, ſmooth. *Flowers* on ſtalks, erect, of a ſky-blue colour. *Seeds* elliptical, very ſhining. For the uſes and management of this valuable plant, we need not repeat what is already given under the article FLAX.

L. *trigynum*. Three-ſtyled golden Flax. Sm. Exot. Bot. t. 17. Ait. Hort. Kew. ed. 2. n. 3. Curt. Mag. t. 1100.—Leaves alternate, elliptical, ſerrated, acute. Styles three. Capſule of ſix cells.—A native of the Eaſt Indies, where it was gathered by colonel Hardwicke on the ſides of mountains flowering in December. The natives call it *Gul Aſhorfee*, from its fine golden hue, *Gul* ſignifying a flower, and *Aſhorfee* a coin of the ſame metal current in India, of the value of 2*l.* ſterling.—*Stem* ſhrubby. *Branches* round and leafy. *Leaves* ſmooth, dark green, pointed, on a ſhort footſtalk. *Flowers* large and handſome, nearly inodorous.

L. *hirſutum*. Hairy Flax. Linn. Sp. Pl. 398. Willd. n. 4. Jacq. Auſtr. t. 31.—Calyx hirſute, acuminate. Flowers ſeſſile, alternate. Leaves on the branches oppoſite.—A native of Auſtria and Hungary, flowering in June and July.—*Root* perennial, woody. *Stems* from a foot and a half to two feet in height, branching towards the top. *Leaves* lanceolate or ovate, hairy at their edges and on their backs, ſometimes nearly ſmooth. *Flowers* blue; the petals ſo cloſely united at the baſe as to reſemble a monopetalous, funnel-ſhaped flower. Linnæus remarks that this is very cloſely allied to *L. nodiflorum*.

L. *hypericifolium*. Mallow-flowered Flax. Curt. Mag. t. 1048,

t. 1048, approaches very nearly to *L. hirſutum.* Its flowers however are larger, and of a reddiſh or purpliſh tinge.

L. *arboreum.* Tree Flax. Linn. Sp. Pl. 400. Curt. Mag. t. 234.—Leaves wedge-ſhaped. Stems arboreſcent. —A native of the Levant, from whence it was ſent to England by Dr. Sibthorp in the year 1788. It flowers from May to Auguſt. This beautiful ſpecies is an arboreous ſhrub, riſing to the height of ſeveral feet. *Stems* rather ſlender, leafy. *Leaves* on ſhort footſtalks, the upper ones ſlightly embracing the ſtem, of a glaucous colour.

The two following ſpecies come under the other ſection of this genus, from having oppoſite leaves.

L. *catharticum.* Purging Flax. Mill-mountain. Linn. Sp. Pl. 401. Engl. Bot. t. 382. Curt. Lond. faſc. 3. t. 19. Fl. Dan. t. 851.—Leaves oppoſite, obovato-lanceolate. Stem forked. Petals pointed.—Not uncommon in elevated, dry paſtures in all parts of Great Britain, bearing flowers from June to Auguſt.—*Root* annual, ſmall. *Stems* leafy, erect, many-flowered. *Leaves* obtuſe, entire. *Flowers* ſmall, white, pendulous before they expand.—Dr. Smith obſerves, in the *Flora Britannica,* that *L. catharticum* is very nearly allied to *Geranium,* for that its ſtamens are ſometimes monadelphous. The whole herb is ſmooth, bitter, and has long been celebrated for its purgative qualities.

L. *quadrifolium.* Four-leaved Flax. Linn. Sp. Pl. 402. Curt. Mag. t. 431.—Leaves four in a whorl.—A native of the Cape of Good Hope, flowering in May and June. *Root* thick and woody. *Stems* numerous, about ſix inches in height, forked, ſlender, upright. *Leaves* four in a whorl. *Flowers* yellow.

This is the original *quadrifolium* of Linnæus, that of Ray having blue flowers.

LINUM, in *Gardening,* comprehends plants of the herbaceous, annual, and perennial ſhrubby kinds, of which the ſpecies are the common flax (L. uſitatiſſimum); the perennial flax (L. perenne); the ſhrubby flax (L. ſuffruticoſum); the tree flax (L. arboreum); and the African flax (L. Africanum.)

In the ſecond ſort there is a variety which is procumbent, with ſmaller flowers.

Method of Culture.—All theſe plants may be increaſed by ſeeds, layers, and cuttings.

But the two firſt ſorts are beſt raiſed by ſowing the ſeeds in the early ſpring months, as March, or the following month, the former in fields or plantation-grounds, where the ſoil is freſh, good, and well reduced into order, by frequent digging over, or ploughing and harrowing, in narrow drills, or broadcaſt, and raked or harrowed in with a light harrow; the plants being afterwards kept perfectly clean from weeds by repeated hoeings.

About the end of Auguſt, when the plants have attained their full growth, and begin to turn yellow at bottom, and brown at top, and their ſeeds to ripen, it is proper time to pull them; though, if it were not for the ſake of the ſeed, they might be pulled a little before the ſeeds ripen, by which the flax is generally better coloured and finer; but if ſuffered to ſtand till the ſeeds are fully ripe, it is commonly ſtronger, ſomewhat coarſer, and more in quantity. It ſhould be pulled up by handfuls, roots and all, ſhaking off all the mould; then either ſpreading them on the ground by handfuls, or binding them in ſmall bunches, and ſetting them upright againſt one another, for ten days or a fortnight, till they are perfectly dry, and the ſeed fully hardened, then houſed, and the ſeed thraſhed out, cleaned, and placed in a dry airy ſituation, being afterwards put up for uſe. The flax, after being rippled and ſorted, ſhould be carried to a pond of nearly ſtagnant water, being placed in it with the bundles croſſing each other in different directions, ſo as to keep the whole in a cloſe compact ſtate, being kept juſt below the ſurface of the water, by proper weights applied upon it. It ſhould remain in this ſteep till the ſtems become brittle and the bark readily ſeparates, when it muſt be taken out and ſpread thinly on a ſhort paſture, being occaſionally turned until it becomes perfectly bleached and dry, when it is in a proper ſtate for the purpoſe of being converted into flax by the huckler.

With regard to the latter, or perennial ſort, it ſhould be ſown in a bed or border of good earth, in ſhallow drills at the diſtance of ſix inches; and when the plants are two or three inches in height, they ſhould be thinned to the ſame diſtances, and in autumn be planted out in the places where they are to grow. But it is probably a better practice to ſow them at once in the places where they are to grow, thinning them out properly afterwards.

The three other ſorts may be beſt increaſed by planting cuttings of the branches in pots of light freſh earth, plunging them in the tan hot-bed, or by layers laid down in the later ſummer months. When the plants in either mode have ſtricken good root, they may be removed into ſeparate pots, and be managed as other tender exotic plants, that require the protection of the green-houſe. And they may likewiſe be raiſed from ſeeds when they can be procured, which ſhould be ſown in pots, and placed in a hot-bed in the ſpring ſeaſon.

The firſt ſort may be ſaid to be one of the moſt valuable plants in the whole vegetable kingdom; as from the bark of its ſtalks is manufactured flax or lint, for making all ſorts of linen cloth; from the cloth, when worn to rags, is made paper; and from the ſeeds of the plant linſeed oil is expreſſed, which is much uſed by painters, and in other arts; and the refuſe, after expreſſion, forms the oil-cakes ſo valuable in the fattening of cattle, ſheep, and other ſorts of live ſtock.

A few plants of this, and the ſecond ſort, may be introduced in the clumps and borders of the pleaſure-ground; and the three other ſorts afford variety in green-houſe collections among other potted plants.

LINUM *Carpaſium, Carpaſian flax,* or *linen,* a term often occurring in the old writers, and uſed by different authors in very different ſenſes.

The firſt uſe we find made of the word, is for the expreſſing a kind of flax which was finer and ſmaller, as well as brighter and more gloſſy, than any other. Pliny uſes the word in this ſenſe, and tells us, that ſuch flax was principally brought from Spain; and that both it, and the linen made of it, were, in his time, called by the name *carpaſian:* from this it became a cuſtom to call all very fine flax, or fine linen, carpaſian linen, and the word ſignified no more than delicate, or fine.

The modern Greeks uſe the word in this ſenſe, and Suidas expreſſes the fineſt linen veils by the term *carpaſian.* The author of the Periplus Maris Erythræi, who was contemporary with Pliny, calls the flax, of which the Indian linens were made, *carpaſos;* but none of the older Greeks have the word. This author is not, however, to be appealed to for aſcertaining the purity of the language of the ancients; for it is plain that he has taken in many words which are not good Greek, nor ever were uſed by any author of credit, but are the mere technical terms of the tradeſmen and merchants of that time.

Pauſanias uſes the word carpaſium linum in a very different ſenſe from all theſe; for with him it is made to expreſs the flax made of the ſtone aſbeſtos, and the linen made of this, which was thrown into the fire to be cleaned. Solinus uſes the word alſo in the ſame ſenſe: he ſays, that in Caryſtos there was found that kind of flax which remained unhurt in the fire; and Hieronymus Mercurialis thinks that the *carbaſus* of the ancient Romans was a word properly uſed only to ſignify the carpaſian flax of Pauſanias, which was not to be deſtroyed by the fire, and was the true ***linum incombuſtibile***, or threads of the aſbeſtos ſtone, or linen made of that material. This, however, is not the ſenſe of the word in later times, for we find it evidently uſed for all linen manufactures of whatever kind.

Linum, *Caryſtium*, in *Natural Hiſtory*, a name given by Pauſanias to the aſbeſtos. It was found plentifully in this author's time, near Caryſtos, a town in the Negropont, and thence obtained its name.

Linum *Catharticum*, *Purging flax*, in *Medicine*, makes a common purge among the country people. It is almoſt as rough as that of *gratiola*.

It is a ſpecies of wild flax, diſtinguiſhed by the name of meadow flax, with ſmall flowers which appear in July, and commonly called mountain-flax, growing without culture on chalky hills and dry paſture grounds in many parts of England, and is taken in infuſion in ale.

This herb is ſaid to be an effectual and ſafe cathartic; an infuſion of a handful of the freſh leaves in whey or white wine, or a drachm of the leaves in ſubſtance with a little cream of tartar and aniſeeds, is directed for a doſe. Linnæus recommends an infuſion of two drachms of the dry leaves as a mild laxative.

It is greatly recommended by ſome in dropſies, and to prevent its griping they mix aniſe or ſome other of the carminative ſeeds with it. It is given in moſt chronic caſes, where people's conſtitutions are ſtrong enough to bear it, and often with great ſucceſs.

Linum *Vivum*, or *incombuſtibile*, cloth made of a foſſile, ſtony ſubſtance, of a whitiſh colour, and woolly texture, ſeparable into threads, or filaments, which will endure the fire without conſuming. See Amianthus and Asbestus.

As to the art of managing this mineral, and of ſpinning and weaving it, &c. the accounts we have are various.

Marco Polo, the Venetian, gives us the manufacture of the linum, found in the province of Chinchinthelas, in Tartary, from one Curſica, a Turk, ſuperintendant of the mines of that country, as follows. The lanuginous mineral, being firſt dried in the ſun, is then pounded in a braſs mortar, and the earthy part ſeparated from the woolly, which is afterwards well ſeparated from filth; being thus purged, it is ſpun into thread, like other wool, and afterwards woven into cloth, which, if foul or ſpotted, they cleanſe, he ſays, by throwing it into the fire for an hour's time, whence it comes out unhurt, as white as ſnow: which very method, according to the account given us by Strabo, ſeems to have been uſed, in ordering the Cretan amianthus; with this addition, that after it was pounded, and the earthy part ſeparated from the woolly, he ſays it was combed; and ſo does Agricola.

Signior Ciampani, after deſcribing four ſorts of the linum, whereof he had ſpecimens in his muſeum; the firſt ſent him from Corfu, the ſecond from Seſtri di Ponente, the third coarſer and darker than the reſt, and the fourth from the Pyreneans; and after obſerving, that though he kept it three weeks in a glaſs-houſe fire, yet he found it unaltered, though it could not preſerve a ſtick wrapped in it, from the fire; he proceeds to ſhew the manner of ſpinning, and making it into cloth, which he effected thus:—He firſt laid the ſtone in water, if warm the better, for ſome time to ſoak; then opened and divided it with his hands, that the earthy parts might fall out of it, which are whitiſh like chalk, and ſerve to bind the thready parts together. This makes the water thick and milky. That operation he repeated ſix or ſeven times, with freſh water, opening and ſqueezing it again and again, till all the heterogeneous parts were waſhed out, and then the flax-like parts were collected, and laid in a ſieve to dry. As to the ſpinning, he firſt ſhews a method diſcovered to him, which is thus:—Lay the linum, cleanſed as before, between two cards, ſuch as they card wool with, where let it be gently carded, and then clapped in between the cards, ſo that ſome of it may hang out of the ſides; then lay the cards faſt on a table, or bench; take a ſmall reel, made with a little hook at the end, and a part to turn it by, ſo that it may be eaſily turned round; this reel muſt be wound over with white thread; then, having a ſmall veſſel of oil ready, with which the fore finger and thumb are conſtantly to be kept wet, both to preſerve the ſkin from the corroſive quality of the ſtone, and to render the filaments thereof more ſoft and pliant, by continuing to twiſt about the thread on the reel in the aſbeſtos hanging out of the cards, ſome of the latter will be worked up together in it; and, by little and little, the thread may, with care, be woven into a coarſe ſort of cloth; and, by putting it into the fire, the thread and oil will be burnt away, and the incombuſtible cloth remain.

But finding this way, of uniting the ſtone with the thread, very tedious; inſtead of the thread, he put ſome flax on a diſtaff, and, by taking three or four filaments of the aſbeſtos, and mixing them with the flax, he found they might be eaſily twiſted together, and the thread thus made much more durable and ſtrong; ſo that there is no need of carding, which rather breaks the filaments, than does any good: only open and ſeparate the filaments, after waſhing, on a table, and take them up with the flax, which is ſufficient.

As to the making of paper, he ſays, in the waſhing of the ſtone there will remain ſeveral ſhort pieces in the bottom of the water, of which paper may be made in the common method. He concludes with the beſt way of preſerving the cloth, or any thing made of the linen, which, by reaſon of its exceſſive dryneſs, is very apt to break, and twiſt; and it conſiſts in keeping it always well oiled, which is the only preſervative. When the cloth is put in the fire, the oil burns off, and the cloth comes out white and purified.

Linum, in *Ancient Geography*, a country of Aſia Minor, in the province of Helleſpont, between Parium and Priape.—Alſo, a promontory of Illyria, in Chaonia.

LINUS, in *Biography*, ſuppoſed to be the firſt biſhop of Rome, was born at Volterra, in Tuſcany. According to Irenæus he received his biſhopric from the hands of the apoſtles Peter and Paul, which he is ſuppoſed to have retained twelve years. He is mentioned by St. Paul in the ſecond epiſtle of Timothy, and is ſaid, by ſome writers, to have been the ſon of Claudia, who is mentioned at the ſame time. Nothing more is known of him which can be relied on, though it has been ſaid that he teſtified to the truth of his principles by ſuffering martyrdom; and two letters in the ſecond volume of the Biblioth. Patr. have been aſcribed to him, but there is no good authority for theſe facts. See Lardner, vol. ii. edit. 1788.

Linus. This perſonage and Orpheus ſeem to have been the moſt ancient poets and muſicians of Greece; but to determine whether Linus was the maſter of Orpheus, or Orpheus of Linus, would be as vain to attempt, as difficult to accompliſh. All that can be done at this diſtance of time, is to compare the opinions of ancient writers upon the ſubject, and to incline to the moſt numerous and reſpectable evidence: and in purſuing this method, it appears that the majority are in favour of the ſuperior antiquity of Linus. No teſtimony places him in a more remote period, or does more honour to his memory, than that of Herodotus; who tells us (Euterp.) "that among other memorable cuſtoms, the Egyptians ſing the ſong of Linus, like that which is ſung by the Phœnicians, Cyprians, and other nations, who vary the name according to the different languages they ſpeak. But the perſon they honour in this ſong, is evidently the ſame that the Grecians celebrate: and as I confeſs my ſurprize at many things I found among the Egyptians, ſo I more particularly wonder whence they had this knowledge of Linus, becauſe they ſeem to have celebrated him from time immemorial. The Egyptians call him by the name of *Maneros*, and ſay he was the only ſon of the firſt of their kings, but dying an untimely death, in the flower of his age, he is lamented by the Egyptians in this mourning ſong, which is the only compoſition of the kind uſed in Egypt."

According to archbiſhop Uſher, Linus flouriſhed about 1280 years before Chriſt, and he is mentioned by Euſebius (Præp. Evang.) among the poets who wrote before the time of Moſes. Diodorus Siculus, who is very diffuſe in his account of Linus (lib. iii. cap. 85.) tells us from Dionyſius of Mitylene the hiſtorian, who was contemporary with Cicero, that Linus was the firſt among the Greeks who invented verſe and muſic, as Cadmus firſt taught them the uſe of letters. The ſame writer likewiſe attributes to him an account of the exploits of the firſt Bacchus, and a treatiſe upon Greek mythology, written in Pelaſgian characters, which were alſo thoſe uſed by Orpheus, and by Pronapides, the preceptor of Homer. Diodorus ſays, likewiſe, that he added the ſtring lichanos to the Mercurian lyre, and gives to him the invention of rhythm and melody, which Suidas, who regards him as the moſt ancient of lyric poets, confirms. He is ſaid by many ancient writers to have had ſeveral diſciples of great renown, among whom were Hercules, Thamyris, and, according to ſome, Orpheus.

Hercules, ſays Diodorus, in learning of Linus to play upon the lyre, being extremely dull and obſtinate, provoked his maſter to ſtrike him, which ſo enraged the young hero, that inſtantly ſeizing the lyre of the muſician, he beat out his brains with his own inſtrument. Heroes are generally impatient of controul, and not often gifted with a taſte for refined pleaſures; hence, relying merely on corporal force, their mental faculties, feeble perhaps by nature, are ſeldom fortified by education.

With reſpect to the dirges, which Plutarch, from Heraclides of Pontus, mentions as written by Linus, we find no account of them in any other ancient author. It appears, however, that his death has given birth to many ſongs of that kind, which have been compoſed in honour of his memory. A feſtival was likewiſe inſtituted by the name of *Linia*, for the celebration of his virtues; and ſo numerous were his inventions, and various the periods and places in which different authors fix them, that ſome have tried to reconcile theſe jarring accounts, by ſuppoſing that there were three ſeveral illuſtrious perſonages of that name; a ſuppoſition which we ſhall not pretend either to affirm or deny.

"The Thebans, ſays Pauſanias (in Bæotic,) aſſure us, that Linus was buried in their city; and that Philip, the ſon of Amyntas, after the battle of Cheronæa, which was fatal to the Greeks, excited by a dream, removed his bones into Macedon, whence, by counſel received in another dream, he ſent them back to Thebes; but time has ſo defaced his tomb, that it is no longer diſcoverable."

Homer (lib. xviii. ver. 569.) has paid a tribute to the memory of Linus, in his deſcription of the ſhield of Achilles.

"To theſe a youth awakes the warbling ſtrings,
Whoſe tender lay the fate of Linus ſings;
In meaſur'd dance behind him move the train,
Tune ſoft the voice, and anſwer to the ſtrain."

Pope, in his note on this paſſage, ſays, from Pauſanias, that "before the yearly ſacrifice to the muſes on mount Helicon, the obſequies of Linus were performed, who had a ſtatue and altar erected to him in that place. Homer alludes to that cuſtom in this paſſage, and was doubtles fond of paying this reſpect to the old father of poetry."

LIO, in *Geography*, a lake of Thibet, about 30 miles in circumference. N. lat. 31° 22′. E. long. 86° 34′.

LIOI-KIA-LANC-TSA, a town of Thibet, 100 miles S.S.E. of Laſſa. N. lat. 28° 8′. E. long. 92° 44′.

LIOIPOU, a lake of Thibet, about 30 miles in circumference. N. lat. 34° 27′. E. long. 90° 34.

LION, Leo, in the Linnæan ſyſtem of *Zoology*, is a ſpecies of quadrupeds belonging to the *felis* or cat kind, with a long tail and pale-red or tawny body. See Felis.

The lion is an inhabitant of all parts of Africa, and the hot parts of Aſia, ſuch as India and Perſia, and ſome few are found in the deſarts between Bagdat and Baſſorah, on the banks of the Euphrates; but they moſt abound in the torrid zone, where the ſize is the largeſt, and their rage moſt tremendous, being inflamed by the influence of a burning ſun and a very dry ſoil. It is obſerved, that, though they reign abſolute maſters over every beaſt, their rage diminiſhes and their timidity increaſes as they approach the habitation of the human race. They have been alſo known to ſpare the weaker animals, and many inſtances are related by A. Gellius, Ælian, and Pliny, &c. of their gratitude. Lions are capable of being tamed; and the monarch of Perſia is ſaid, on days of audience, to have two large lions chained on each ſide of the paſſage to the room of ſtate, led there by keepers in chains of gold. The lion preys on all kinds of animals; having rouſed them into view by his roar, he ſtarts on his prey, ſtriking it with his talons, and tearing it to pieces. He alſo invades the folds, leaping over the fences with his prey, and his ſtrength is ſo great, that he can carry off a middling ox with the utmoſt eaſe. He ſometimes ſeizes his prey by ſurprize, and mankind falls a victim to his hunger, more through neceſſity, as it is ſaid, than choice. The Arabs have a notion of his ſparing the tender ſex, but Dr. Shaw informs us in his Travels, p. 244, that the lion obſerves no diſtinction in theſe days. The fleſh is often eaten in Barbary, and is ſaid to reſemble veal in taſte. Pennant's Brit. Zool. p. 165, &c.

Lion-*Monkey*. See Simia *Oedipus*.

Lion, *Seal*. See Phoca *Leonina*.

Lion-*Puceron*, in *Natural Hiſtory*, the name given by Mr. Reaumur to a genus of worms which deſtroy the pucerons in the ſame manner that the formica leo does the *ants*.

Theſe little inſects are a prey alſo to a ſort of worm hatched from the egg of a two-winged fly. This has no legs, and is of ſeveral colours. See Ver-*Puceron*.

Though theſe lion-pucerons be all hexapodes, yet they are of different origin; ſome being produced from the eggs of a four-winged fly, others from thoſe of a beetle. As the formica leo has two horns, the extremities of which ſerve him by way of mouths, our lion-puceron has the ſame kind alſo; but as the former of theſe inſects can only move backwards, and is forced to make ſnares for his prey, not being able to hunt it, this creature runs very nimbly in the com-

-mon way, and ſeizes its prey, without having recourſe to ſuch ſtratagems.

The body of the lion-puceron is longer than that of the formica leo, and is flat; the breaſt is the thickeſt and broadeſt part of it, and from this it gradually tapers off to a point at the tail; it has two legs fixed to the breaſt, the other four to the anterior rings of the body; and when it moves, the poſterior end of the body ſerves it in the place of a ſeventh leg, for it always bends it downward, and draws it along the ſurface it walks upon. The back of this creature is not ſmooth or gloſſy, but is every where rough, and full of wrinkles, and ſeems as if every ring of it was compoſed of ſeveral other ſmaller rings.

This is the general deſcription of the creature, treating of it in the general way, theſe characters ſuiting all the kinds of it. There are others, however, by which the whole claſs may be divided into three principal kinds.

Theſe are much more voracious devourers of the pucerons, than the worms which feed on them. A ſmall puceron, ſeized by one of them, is eaten in an inſtant, and the very largeſt is not the work of half a minute for them.

Theſe creatures are very ſmall when firſt produced from the egg, and yet they immediately begin to feed. They are ſo ravenous of food alſo, that whenever they can they catch and eat one another. But as the pucerons, among which they live, are eaſier to be caught, they uſually eſcape one another's fury pretty well; unleſs where there is a ſcarcity of the pucerons, or when they offend one another.

It is eaſy to conceive that a creature, which feeds ſo very faſt, muſt ſoon arrive at its full growth; and this is the caſe with theſe animals, for within five or ſix days of their being hatched from the egg, they are ready for their final tranſformation, or the putting on the form of the animals to whoſe eggs they owed their origin. In order to this, the creature leaves the place where he has hitherto fed, and ſeeks the folds of a leaf, or ſome other ſuch convenient receptacle, where it ſpins a web of very fine ſilk, every way ſurrounding its body with it, and under this cover paſſes the ſtate of a nymph or chryſalis. The ſilk of this web is not only very ſtrong, but the threads are very cloſely laid together, ſo that it is much firmer than the webs of any of the caterpillar kind. It is of a roundiſh figure, and is ſomewhat ſmaller than a pea.

This round figure is owing to the form into which they roll up their body, which ſerves as a mould for it; and the orifice, out of which the ſilky matter is produced, is at the extremity of the poſterior part of the body. The creature continues in this ſtate about three weeks, if it be in the beginning of ſummer that it goes into it; but if toward autumn, it remains in it all the following winter; and is afterwards, in ſpring, ſeen to come out in the form of a very beautiful fly, of a remarkable large ſize, in proportion to the creature it is produced from, and the web out of which it comes. It is a very long-bodied one, and much reſembles the libella or dragon-fly, only that its wings are larger in proportion to its body: theſe wings are of a moſt delicately fine ſtructure, the fineſt gawſe being coarſe and thick in compariſon to them. Theſe, when the creature is at reſt, are placed in an angle over the body, and form a ſort of canopy or tent for it; but they are ſo perfectly tranſparent, that the body is eaſily ſeen through them. The body and breaſt are all green, and that of a very beautiful tinge; but the moſt remarkable beauty of this creature is its eyes: theſe are large and prominent, and are of a fine gold colour, and of greater luſtre than the moſt highly poliſhed metal.

The eggs of this fly are a very ſingular object, and cannot have eſcaped the eye of any perſon who is converſant among the inſects which live on trees; though of the many who have ſeen them, perhaps few or none ever found what they really were. It is common to ſee on the leaves and pedicles of the leaves of the plum-tree, and ſeveral other trees, as alſo on their young branches, a number of long and ſlender filaments, running out to about an inch in length, and being of the thickneſs of a hair: ten or twelve of theſe are uſually ſeen placed near one another, and a vaſt number of theſe cluſters are often found on the ſame tree. The end of each of theſe filaments is terminated by a ſort of ſwelling or tubercle of the ſhape of an egg. People who have obſerved theſe, have generally ſuppoſed them to be of vegetable origin, and that they were a ſort of paraſitical plants, growing out of others, as the miſletoe, moſſes, &c. from the oak and other trees. They very much reſemble in figure thoſe ſpecies of mouldineſs, which Malpighi and others have figured under the ſhape of little muſhrooms, only they are much larger than thoſe little plants, and bear the heat of the ſun and other accidents uninjured, which would deſtroy the tender plants of that kind. There is a time, when theſe egg-like balls, which terminate every one of theſe filaments, are found open at their ends, and in this ſtate they very much reſemble flowers, and they are in this ſtate figured by ſome authors under the name of flowers of a ſingular kind, found on the leaves of the willow. All this, however, is wholly erroneous, and the purſuing the hiſtory of our lion-pucerons ſhews their true origin to be from the fly of that creature. What theſe authors took for flowers of the willow were only the eggs of this fly, out of which the young animals had been hatched, and had made their eſcape. The leaves and branches, on which theſe eggs are found, are uſually ſeen covered over with the pucerons; and the creature providing a place where her young ſhall find nouriſhment as ſoon as hatched, places her eggs in the midſt of theſe harmleſs and defenceleſs animals, fixing each on a ſlender pedicle, yet ſufficiently ſtrong to bear its weight. If theſe eggs be nicely examined, a worm may be diſcovered in them while yet whole; but the moſt certain way of judging of them is, to put ſeveral of them into a box, in which caſe every one of them is found at a proper time to hatch, and to give an inſect; which, when viewed by the microſcope, appears plainly to be a lion-puceron in all its parts, and requiring only increaſe in ſize, without any change of ſhape, to be one of thoſe we have already deſcribed, as feeding ſo voraciouſly on the pucerons. Reaumur's Hiſt. Inſ. vol. vi. p. 142.

LION, *Ant*, in *Zoology*. See FORMICA *Leo*.

LION'S *Foot, Candia*, in *Botany*. See CATANANCHE.

LION'S *Leaf*. See LEONTICE.

LION'S *Tail*. See LEONURUS.

LION'S *Cove*, in *Geography*, a ſmall bay in the ſtraits of Magellan, ſurrounded by rocks. The water is deep, the ground is good, and water may be obtained, but no wood. The only refreſhments which this bay affords are limpets, muſcles, rock fiſh, and celery. S. lat. 53° 26. W. long. 74° 25′.

LION *Mountain*, a mountain of Africa, near the Cape of Good Hope, deriving its name from a ſuppoſed reſemblance to the lion. It conſiſts of the Lion's head, which is a bare rock 2160 feet high; and the Lion's tail or rump, which is alſo rocky, but covered with a ſlight ſtratum of earth, 1143 feet high. This earth yields an inferior kind of graſs, to which every one's cattle has acceſs. Upon both theſe ſummits are erected enſign ſtaffs, upon which ſignal flags are hoiſted as ſoon as any ſhips are perceived at ſea. Theſe ſignals, whilſt the Cape remained in poſſeſſion of the Dutch, were changed every month; and advices were ſent two years before to Holland and the India ſettlements; and ſealed letters, containing the detail of them, are given to the commanders of veſſels, who are to touch at the Cape; which letters are opened when they arrive within ſight of the mountains, that they may aſcertain whether or not the place be in the hands of their countrymen, and accordingly avoid it or proceed to an anchorage in the bay. A cannon is alſo fired on Lion's head, ſo often as to correſpond to the number of ſhips that appear, in order to give notice to Cape Town; and this notice is facilitated by the reverberation which the ſound makes againſt the ſteep ſides of the Table mountain.

Lion *d'Angers*, *Le*, a town of France, in the department of the Maine and Loire, and chief place of a canton, in the diſtrict of Segré; 10 miles N.N.W. of Angers. The place contains 1728, and the canton 9578 inhabitants, on a territory of 247½ kiliometres, in 12 communes.

LIONARDO da Vinci, in *Biography*. See *Da* Vinci.

LIONCELES, in *Heraldry*, a term for lions when there are more than two of them borne in any coat of arms, and no ordinary between them.

LIONINE, or Lionade, in the hiſtory of the *Coins* current in Ireland, a name given to certain coins, imported privately from France and other places. There were, beſide theſe, many others of the ſame ſort, impreſſed with eagles, roſes, and the like, and called by names ſignifying thoſe impreſſions. They were a very baſe and poor ſort of money; the penny *lionade*, or *lionine*, not coming up to the value of the halfpenny of the coin of the kingdom. They were diſcountenanced in the year 1300; and good money being ſtruck there, it was made death, and confiſcation of goods, to import any of them, and the run of them was thus ſtopped.

LIONS, in *Geography*, a town of France, in the department of the Eure, and chief place of a canton, in the diſtrict of Les Andelys; nine miles N. of Grand Andelys. The place contains 1828, and the canton 9905 inhabitants, on a territory of 125 kiliometres, in 13 communes.

LIOSK, a town of Lithuania, in the palatinate of Troki; 20 miles W. of Grodno.

LIOTARD, John Stephen, in *Biography*, a painter in enamel, crayons, and miniature, who was born at Geneva in 1702. He went to Paris to ſtudy in 1725, and thence accompanied the marquis de Puiſieux to Rome, where the earls of Sandwich and Beſborough engaged him to accompany them to Conſtantinople. There he became acquainted with ſir Everard Fawkener, our ambaſſador, who perſuaded him to come to England.

He attempted to make himſelf conſpicuous by adopting the habits and manners of the Levant, and acquired by that and his talents, which were far from contemptible, (particularly in enamel,) a conſiderable degree of encouragement among the nobility and gentry of this country. But his pictures want grace and taſte; he was too cloſe a copyiſt of what he ſaw, and did not make his pictures pleaſing enough to hold his practice when Roſalba became his competitor in crayons.

LIP, or Lips, in *Anatomy*. See Deglutition.

Lip, *Cancer of*, in *Surgery*. Such caſes as uſually go under the denomination of cancers of the lip, are attended with conſiderable variety, both in regard to the manner in which they begin, and the appearances which they put on in their progreſs. It is often exceedingly difficult to pronounce, with certainty, whether particular ulcers of the lips ought to be called cancers or not. For, if we can truſt to the reports of ſurgical authors, very inveterate ſores upon the lips are frequently excited and kept up by a diſordered ſtate of the abdominal viſcera, and many inſtances at firſt taken for cancers, have in the end yielded to different remedies. Thus, a painful induration in the lip, which was ſuppoſed to be an occult cancer, is recorded to have been cured by the employment of emetic and purgative medicines, eſpecially the helleborus niger. (Jourdain, Maladies de la Bouche, tom. ii. p. 172.) Richter and other continental ſurgeons conſider it as aſcertained, beyond doubt, that many bad ulcers of the lips are connected with gaſtric diſeaſes, by which we are to underſtand diſorders of the viſcera ſubſervient to digeſtion, as the ſtomach, liver, bowels, &c. We are informed of a malignant-looking ſore of the lower lip, which proceeded from the projection of an unnaturally long inciſor tooth of the upper jaw, and which healed of itſelf as ſoon as the irritating tooth was extracted. (Jourdain, l. c. p. 196.) Scorbutic ſores upon the lips have ſometimes been miſtaken for cancers, and at length yielded to anti-ſcorbutic medicines. (Metzger Adverſaria, vol. ii.) Even ſores which have been occaſioned on the lips by chilblains, have ſometimes been erroneouſly regarded as cancers. Many ulcers on the lips which at firſt are quite of an harmleſs nature, are rendered malignant by the ſtimulating and cauſtic applications made uſe of, almoſt every unhealthy ſore in this ſituation attracting a ſuſpicion of carcinoma, and leading the haſty practitioner to dreſs it with irritating and eſcharotic ſubſtances. But the caſes which, of all others, are the moſt liable to be miſtaken for cancers of the lip, are venereal ulcers. Theſe are ſaid to have been ſometimes cut out by indiſcriminating ſurgeons, who, inſtead of ſeeing the wound heal favourably, have had the double mortification of witneſſing the return of more extenſive ſyphilitic ulceration in the part, and on the adminiſtration of mercury, having their blundering conduct detected by the offended patient, and expoſed to the obloquy of the world.

Whoever meditates on the foregoing facts, muſt be convinced of the impropriety of making haſty and poſitive deciſions, concerning the nature of ulcers on the lips. Bad ill-looking ſores are, indeed, formed with particular frequency on theſe parts of the face; but moſt of them are not of ſo malignant and incurable a character, as to merit the appellation of cancer. Many of them, as we have already ſtated, are exaſperated by wrong modes of treatment, and the lips, in conſequence of their inceſſant motion, are unqueſtionably a diſadvantageous place for cicatrization in general.

The diſeaſes to which cuſtom has aſſigned the name of cancer of the lip, may begin in different ways, and aſſume various appearances. They often commence in the form of a warty excreſcence, which, after attaining a certain ſize, breaks out into ulceration. They frequently come on in the ſhape of a phagedenic ulcer; while, in other inſtances, they begin as a hard lump, which at laſt falls into the ulcerated ſtate. In ſome caſes much pain is experienced; in others, the degree of ſuffering is inconſiderable. The occaſional cauſes are ſubject to equal variety. Sometimes the diſeaſe appears to come on of itſelf. In other examples, its origin is referred to a ſmall pimple, chap, or excoriation of the lip. We are told of a caſe, where a cancerous ulcer of the tongue and one ſide of the mouth occurred, in conſequence of inadvertently drinking ſome liquor, with which an ulcerated cancer of the breaſt had been waſhed. Gooch, Chirurgical Works, vol. ii. p. 127.

The lower lip is that which is commonly affected, the upper one being attacked only in a ſmall proportion of the caſes which preſent themſelves in practice. It is alſo alleged, that the diſeaſe is much more frequent in the male than the female ſex. (Richerand, Noſographie Chirurgicale, tom. iii. p. 253, edit. 2.) One important fact, in which all the beſt informed ſurgeons agree, is, that cancers of the lips and face in general are far leſs malignant than carcinoma of the breaſt, or at leaſt, admit of being effectually extirpated with the knife or cauſtic with more extenſive ſucceſs. The prudent ſurgeon, before removing a cancerous breaſt, feels himſelf obliged to explain the poſſibility of a return of the diſtemper; but when the lip is the part affected, and care is taken to remove every particle of the diſeaſe, he may be much bolder in his promiſes.

The medicines uſually tried in other caſes of carcinoma, may be exhibited in thoſe of cancerous lips. (See CANCER.) The internal employment of arſenic has in particular been much praiſed. On the whole, however, we have little confidence in any thing but extirpation, and it is only in doubtful caſes, that delaying the operation to try the effect of medicines or applications can be very juſtifiable. Waſting time till the diſeaſe affects the lymphatic glands under the jaw, or ſpreads ſo extenſively, that the wound after the operation cannot be united, is ſerious miſconduct in the ſurgeon, for the ill conſequences to the patient are irremediable. In the firſt caſe, the diſtemper under the jaw moſtly cannot be taken away; in the ſecond, if the lower lip be affected, as is commonly the caſe, great deformity, imperfect ſpeech, and (what is more terrible) a continual ſlavering muſt for ever remain; or at moſt, admit of only ſlight palliation by artificial contrivances.

There are now only two modes of extirpating cancers of the lip; one with cauſtic, the other with a knife.

In theſe caſes, cauſtic has been very extenſively employed, and ſucceſs may be expected from the method, when the whole of the diſeaſe admits of being at once deſtroyed by a ſingle application. But when the cauſtic muſt be repeatedly uſed, it not only proves in many inſtances ineffectual, but often aggravates the diſeaſe. Nearly all the varieties of cauſtic have been employed by different practitioners. The great thing is to have one that is exceedingly active, and the kali purum with quick-lime is as good as any. We have read of a caſe which was cured by means of a burning glaſs, though we do not perceive any advantage that this plan can have over the employment of cauſtic. Comte, Hiſtoire de l'Acad. Royale de Médecine, ann. 1776.

Let it not be inferred from the foregoing obſervations, that we are advocates for the uſe of cauſtic, as we frankly own, that although it was our duty to mention the practice, we ſhould be aſhamed of adopting it. In every caſe where cauſtic can be employed, the knife can always be uſed with advantage. It does its office more quickly, and with leſs pain, at the ſame time that it accompliſhes the removal of the diſeaſe, and ſurrounding ſubſtance with greater certainty and exactneſs. But the grand recommendation is, that the wound made with a cutting inſtrument is ſuch as can be evenly united by the firſt intention.

Notwithſtanding the teſtimony of the beſt ſurgical writers, in ſupport of the very frequent ſucceſs attending the extirpation of cancers of the lip, one modern author is adverſe to making ſuch attempt at all, either with cauſtic or with the knife. (Jourdain, Mal. de la Bouche.) This doctrine, we confeſs, ſurpriſes us a good deal, as being ſo repugnant to the ſentiments which we have derived, not merely from the moſt accurate books, but from the obſervation of numerous cures. If M. Jourdain has, in his own individual practice, met with many inſtances of a return of the diſeaſe after the operation, we cannot help ſuſpecting, that his mode of extirpation muſt have been faulty and incomplete.

Although it is an important maxim in the operation, to make the wound of ſuch a ſhape as will admit of an even union, it is a ſtill more important point to remove every particle of the diſeaſe. The majority of relapſes are unqueſtionably imputable to the neglect of this material object, and not to the incurableneſs of the complaint. It is always better to remove too much rather than too little, for the lips are ſo very yielding, that, in numerous caſes, nearly the whole lip has been cut away, and yet the wound has been united without deformity. At the time that we are writing this article (namely Auguſt 1811,) there is in St. Bartholomew's Hoſpital a caſe, where the greater part of the lower lip was removed by Mr. Vincent on account of a cancer; but, notwithſtanding this great loſs of ſubſtance, the edges of the wound were eaſily brought into contact.

The operator ought not only to take away all that is manifeſtly ſwollen, ulcerated, or indurated; he ſhould be careful likewiſe not to leave any parts which are at all diſcoloured. In ſhort, it is ſafeſt to make the inciſions at ſome little diſtance from the perceptible boundaries of the diſtemper. The extent of the diſeaſe upon the inſide of the lip will always demand careful examination.

When the whole lip is thoroughly cancerous, the practitioner is under the neceſſity of cutting every particle of it away, in which circumſtance the wound will not admit of union, but muſt heal by granulations. On the contrary, when the extent of the diſeaſe is more moderate, the operator ſhould always make the wound in the manner of that practiſed for the cure of the hare-lip, ſo that it may be united by means of the twiſted ſuture. (See HARE-LIP.) As the lips are very tenſile, this method is generally practicable; and it is well known, that the twiſted ſuture may be ſucceſsfully employed, though two-thirds of the lip have been cut away.

The ſooner the operation is undertaken, the greater is the chance of ſucceſs. Caſes only become irremediable through delay, or an ineffectual uſe of cauſtic or the knife. The more extenſive the malady is, the more difficult it is to cure. The caſe indeed is paſt relief, when the diſtemper has ſpread to the bones, the gums, the glands beneath the jaw, or any other parts which cannot be removed. The ſurgeon, however, muſt relinquiſh no caſe where there is a poſſibility of making an effectual removal of the morbid parts.

The mere magnitude of a cancerous tumour is not prohibitory of the operation. In one caſe, exciſion was performed moſt ſucceſsfully, notwithſtanding the excreſcence was ſo large as to hang down on the breaſt. (Le Dran, Obſerv. tom. i. p. 78.) In another example, the operation had the happieſt conſequences, although the inſide of the lip and cheek felt as rough as if it had been ſmeared all over with ſand. (Richter's Anfangſgr. &c. Band 2, p. 326.) Richerand upbraids with timidity, ſurgeons who are ſtopped by the extent of the malady, and he contends, that extirpation ſhould be undertaken, even though it be neceſſary to ſeparate the ſoft parts from the lower jaw bone, provided the glands under the chin are free from diſeaſe. He informs us, that Chopart, after removing in one caſe the whole of the lip, and a portion of the cheek, was obliged to cover the denuded jaw with the integuments of the neck. Notwithſtanding ſuch loſs of ſubſtance, the wound healed; the opening of the mouth remained for a time contracted; but it ſerves (ſays this author) for the admiſſion of aliment, and gradually becomes larger, the power of better pronunciation alſo returning. Noſographie Chirurgicale, tom. iii. p. 252, edit. 2.

Whenever the caſe is ſuch, that an attempt to unite the wound can be practiſed, the ſurgeon muſt take away a triangular portion of the diſeaſed lip, ſo that the inciſion may reſemble the letter V, and its edges be eaſily brought together with the twiſted ſuture, as in the operation for the hare-lip.

The union of wounds of the lower lip is an exceedingly important object, ſince, beſides the deformity, a more ſerious grievance ariſes from the ſeparation, namely, the continual involuntary diſcharge of the ſaliva, which is naturally confined within the mouth by the lower lip. Nothing can be more annoying than ſuch an infirmity, and by impairing digeſtion, it alſo proves extremely hurtful to the health. A patient whoſe lower lip is ſo extenſively diſeaſed, that extirpation cannot be effected, without inducing this affliction, is in a truly pitiable ſtate.

That the health ſuffers greatly from the inceſſant loſs of the ſaliva, is a fact confirmed by numerous caſes. A woman had a cut through her lower lip, and the wound, being neglected, ſuppurated, and its margins healed. The conſequence was that the ſaliva conſtantly eſcaped from her mouth, and from being a healthy-looking woman before the accident, ſhe became rapidly emaciated, afflicted with ſtomach complaints and difficulty of digeſtion. Tronchin, being conſulted, ſaw that her indiſpoſition proceeded from the loſs of a nutritious fluid. He adviſed uniting the diviſion by the operation for the hare-lip. This was actually done by Ferrand. The loſs of the ſaliva was prevented, and the patient ſoon regained her health and good looks again.

It would ſeem that children can bear the loſs of a large quantity of the ſaliva better than adults. A little girl, ſix years old, was brought into the hoſpital of St. Louis, afflicted with a gangrenous carbuncle, that had not only ſpread to the whole lower lip, and ſoft parts about the chin, but alſo to the body of the jaw. The ſloughing having ſtopped, the dead parts were detached, the body of the lower jaw-bone ſeparated from the rami at the places of anatomical diviſion. In this caſe, the circumſtance particularly worthy of notice is, that although the ſaliva was inceſſantly running out of the mouth, ſo as to wet all the girl's clothes, ſhe enjoyed, during the ſix months ſhe was in the hoſpital, a good appetite, and had every appearance of being well nouriſhed. See Richerand's Noſographie Chirurg. tom. iii. p. 255, edit. 2.

Lip, *Hare*,
Lip, *Preternatural Fiſſure of*, } See Hare-lip.

Lip, *Wounds of*. In theſe caſes the chief indication is to place the edges of the diviſion in exact and even contact, in order that they may unite by the firſt intention. The twiſted ſuture will generally be found the moſt advantageous for this purpoſe. It is to be applied in the manner explained in the article Hare-lip, in conjunction with narrow ſtrips of adheſive plaſter, and a bandage that will preſs forward the integuments of the face. Whether one or two pins ought to be uſed muſt depend upon the length of the diviſion. When the wound is lacerated, or contuſed, it often cannot be hindered from ſuppurating, and union by the firſt intention is prevented. However, in ſuch inſtances, a pin may frequently be employed with benefit, as a partial adheſion may take place, though the agglutination is not general. And even when theſe wounds ſuppurate, maintaining the edges near each other with ſtrips of adheſive plaſter will materially leſſen the breadth of the ſcar, and expedite the cure. Sometimes it may be proper to poultice a contuſed or lacerated injury of the lip, where there is no immediate proſpect of adheſion, and the part has a ſloughy aſpect; but this plan ſhould only be continued till the wound puts on a cleaner appearance and begins to granulate; the proper method being now to apply adheſive plaſters, and a pledget of any common unirritating ointment.

Lip *of a Horſe*, in the *Manege*, is the ſkin that covers the ſides of the mouth, and ſurrounds his jaws. A horſe is ſaid to arm or guard himſelf with his lips, when his lips are ſo thick that they cover their bars, and keep off the preſſure of the curb.

LIPA, of λιπος, *fat*, a word uſed frequently by Hippocrates to expreſs any thing fat or oily. He calls certain ſtools, which have a fatty appearance, by this name. Theſe are eſteemed a ſign of great colliquation. He alſo applies it to a ſort of fatty ſubſtance, often ſeen ſwimming on the ſurface of the urine like a ſpider's web: this the ſame great author gives as a ſign of a conſumption.

Lipa, in *Geography*, a town of Lithuania, in the palatinate of Novogrodek; 32 miles W.N.W. of Sluck.—Alſo, a town of Croatia, on the river Dobra; 10 miles S.W. of Carlſtadt.

LIPARÆUS Lapis, in the *Natural Hiſtory of the Ancients*, the name of a ſtone uſually found in Lipari, one of the Æolian iſlands, and brought thence in the time of the Greeks among the pumices, of which that place always afforded them a large quantity.

It was a ſmall ſtone, about the bigneſs of a filbert, of an irregular and uncertain ſhape, and porous and friable conſtitution, like that of the pumices, but more eaſily falling to pieces on rubbing between the fingers than even the ſofteſt of them; the colour was a duſky grey, and the whole external ſurface plainly ſhewed that it had ſuffered changes by the means of fire. The ſtone at preſent, however, is ſo little regarded, that the writers on ſuch ſubjects have even forgot to name it. They are ſometimes brought to us, to this day, among the pumices from the burning mountains, but are not regarded.

LIPARI, in *Geography*, a volcanic iſland, or rather a group of ſuch iſlands, in the Mediterranean, about twenty-four miles from the N. coaſt of Sicily. They were formerly called Æolian *Iſlands*, which ſee; and now *Iſole di Lipari*, from the name of the chief of them. Theſe iſlands were anciently known to be volcanic, and called Volcanian, but it is in modern times that their volcanization has been conſidered as an object of intereſting reſearch to philoſophers, among whom M. de Luc, ſir W. Hamilton, Dolomieu, and Spallanzani have diſtinguiſhed themſelves. Theſe iſlands are commonly reckoned ten in number, though ſome by omitting and others by comprehending ſome barren rocks, have diminiſhed or increaſed their number. The largeſt is Lipari, being 19½ Italian miles in circuit. Accordingly this iſland, from its extent, the city which renders it illuſtrious, the number of its inhabitants, its agriculture and commerce, claims pre-eminence above all the others by which it is ſurrounded. Nor is it leſs important in the eſtimation of the naturaliſt from the quantity, variety, and unuſual beauty of the volcanic products which it contains. It is well known, by the teſtimony of Diodorus (l. 5.), that all the Æolian iſles were ſubject to great eruptions of fire, and that their craters and mouths were viſible in his time. As to Lipari, however, very few memorials have been preſerved of its ancient conflagrations. Of the antiquity of the iſland, and of its exiſtence before the Trojan war we are certain, ſince we learn from Homer, that, after the taking of Troy, Ulyſſes landed there, and was treated with the utmoſt urbanity and courteſy by king Æolus, during the whole month of his continuance there (Odyſſ. l. 10.); and though we allow to the poet the uſual licence of poetry, it is ſtill moſt certain that he could not have named this iſland, and the city it contained, unleſs they exiſted at the time when he wrote his poem, above

3000 years ago. But if we conſult other ancient and credible writers, we ſhall find that before Æolus, Liparus reigned in this iſland, and that from him it took its name, being before called " Meiogonis," or, according to others, " Meligunis." The antiquity of this iſland may alſo be inferred from the manner of its production by ſubterraneous eruptions, in which the decompoſition of volcanized matters is neceſſary, which requires a conſiderable interval of time. If, therefore, Lipari had inhabitants and cities, and was a cultivated country before the deſtruction of Troy, it is evident that it muſt have exiſted many ages prior to that event. But from the time when mention is made in hiſtory of this iſland to the preſent day, it is pretty certain that no true eruption or current of lava has taken place in it; for if this had been the caſe, ſome memorial would have been preſerved of it as well as of thoſe of Stromboli and Vulcano. The ſtoves and the warm baths of Lipari are the only places in the whole iſland where any ſigns remain of unextinguiſhed volcanos. Spallanzani made a circuit of this iſland for the purpoſe of firſt examining its ſhores, and he then aſcended its mountains in its interior parts. In examining its ſhores, he began with the city of Lipari, which extends along the ſhores in the form of an amphitheatre; and in his reſearches in the harbour itſelf, under the caſtle of the city, he found that it is erected on an immenſe rock of lava, that riſes perpendicularly from the water, and is entirely deſtitute of all vegetation, except a few ſtalks of the Indian fig (Cactus opuntia, Linn.) which grew in its fiſſures. This lava has for its baſe feldſpar, is of a fine compact grain, of a ſcaly fracture, dry to the touch, and gives ſparks, like flint, with ſteel. The colour is cinereous, approaching in many places to that of lead. This lava is joined to large maſſes of glaſs, which form a whole with it, without any ſeparations or diviſions in the middle. It is therefore the ſame lava, either retaining its own nature or tranſmuted into glaſs. This glaſs, like the lava, gives ſparks with ſteel; but the lava is opaque, whereas the glaſs, in the angles and thinner edges, has a conſiderable degree of tranſparency. The ancient exiſtence of fire in this place is evinced by another circumſtance, *viz.* that the vitreous ſubſtances already noticed are frequently accompanied by pumice, which are, in fact, only an imperfect glaſs. In viewing the ſteep maſſes of glaſs and lava, which riſe perpendicularly from the ſea, like a wall, they are ſeen to be interſperſed with different ſtrata of pumice, which is of two kinds; the one heavy and compact, the other light and porous, and both of a cinereous colour. The firſt ſort is of the ſame nature with the lava of the rock; but the other kind is rather ſcaly than filamentous, and its ſcales have a degree more of vitrification than the other. This pumice is uſually a continuation of the other, and, according to our author, derives its origin from the greater degree of heat which it has ſuſtained. Upon attentively examining this mixture of lava, glaſs, and pumice which forms the body of the rock, it appeared evident that there muſt have been ſeveral currents that had flowed down the ſides, and, perhaps, from the ſummit, of the contiguous mountain Della Guardia, into the ſea; ſince the direction of their deſcent is found on that ſide, and even the filaments of the pumices point towards that mountain. The lava, glaſs, and pumice exhibited neither feldſpars, ſhorls, nor any other extraneous body, either, as our author conceives, becauſe they have melted by the fire, or, perhaps, becauſe they never exiſted in them. The lava and glaſs of the rock, when expoſed to the furnace in ſeparate crucibles, fuſed into a light-grey glaſs; the globules which before appeared in them melting at the ſame time; during liquefaction theſe ſubſtances, which filled only one quarter part of the crucible, ſwelled ſo much, that they roſe ſeveral times above the edges of the crucible, and flowed over its ſides. The two kinds of pumice, though both derive their origin from the ſame feldſpar, which is the baſe both of the lava and the glaſs, afford different reſults in the ſame fire; ſince their volume, inſtead of being augmented, is diminiſhed, only retaining its former colour.

The haven of Lipari forms a curve in the ſhore, which to the ſouth begins at the foot of the Monte Capiſullo, and ends to the north-eaſt at the bottom of the Monte della Roſa. After having examined that part of the ſhore which is contiguous to the harbour, lying under the caſtle, and on the right ſide of Monte Capiſullo, our author made the circuit of the remainder of that curve to the baſe of Monte della Roſa. The objects that here attracted his notice were firſt a tufa, which the induſtry of the inhabitants had converted into a ſoil ſuitable to ſmall vineyards, and next a maſs of crags and precipices, partly fallen into the ſea, and partly threatening to fall; among which, beſides ſcoriæ of an iron colour, he met with beautiful volcanic breccias of lava of a petroſiliceous baſe, containing ſmall particles of glaſs and pumice. At the foot of the Monte della Roſa, where the harbour of Lipari ends, our author perceived on the ſhore a ſtone, which, from its ſingularity, drew his attention. It formed a rock riſing in part above the ſea, and in part concealed by the water. It was at firſt taken for a jaſper: its ground was of a red-blood colour; it gave ſparks ſtrongly with ſteel, was of a rather fine grain, and had almoſt the hardneſs of quartz. On a more attentive examination this ſtone was perceived not to be ſimple like the jaſper, but of a compound formation, containing in it reddiſh ſcales of feldſpar and ſhorls, which gave it the character of that kind of porphyry which has for its baſe a hard horn-ſtone. This ſubſtance our author, after careful inveſtigation, cannot exclude from the number of true and real lavas, though he cannot affirm that its redneſs is an effect of calcination, as is the caſe in other lavas, ſince of this it does not exhibit the ſlighteſt indication. The reaſons of fact on which Spallanzani grounds his opinion, that this porphyritic rock has paſſed into the ſtate of lava, are two; the great number of minute cells it contains in many parts of it, and the direction of thoſe cells. Hence he concludes, that this ſtone is not only a true porphyritic lava, but that it once flowed from the mountain to the ſea, and in its motion the naturally circular figure of its pores or cells was changed into an oval. The ſame appearance has always been obſerved, on a ſmaller ſcale, in re-melted lavas, and glaſſes. All the ſpecies of this kind of lava are not, however, of a blood-red colour; ſome of them are of a duller red, though the component principles of both are eſſentially the ſame. This lava, when fuſed in the furnace, doubled its volume, and its upper part aſſumed a vitreous convexity, which was ſmooth, ſhining, ſemi-tranſparent, and of a greeniſh tincture; but internally it was a very black vitreous ſcoria, extremely porous, and ſufficiently hard to give ſparks with ſteel.

In purſuing his tour our author found that Lipari, like the other Æolian iſles, is at its baſe more or leſs corroded by the ſea, which is frequently in a ſtate of violent agitation: the lower excavations cauſe the parts above them to give way, and, in a ſeries of years, great maſſes fall into the ſea. To this the nature of the lava, which is full of cracks and fiſſures, conſiderably contributes; not to mention the influence of the humidity of the atmoſphere, and other deſtructive elements. Large heaps of theſe fragments accumulate on the ſhore, and make room for others, and thus a gradual diminution of the iſland takes place. Beyond the harbour and the porphyritic rock, our author found the ſea forming a kind of bay within the land, round which a few cottages are built, affording ſhelter to a ſmall number of inhabitants, who ſubſiſt by the profits of a vineyard that ill repays their labour. The name of this place is Canneto; and above it is a current of lava, of an argillaceous baſe, ſimilar to that of the Arſio in Iſchia. At the diſtance of three miles from the haven of Lipari is Campo Bianco (the White field), ſo called, becauſe it is a lofty and extenſive mountain, compoſed entirely of white pumices. For the nature, production, and properties of *Pumice*, we refer to that article. The mountain, which is a prodigious maſs of pumice, riſes almoſt perpendicularly from the ſea, and, ſeen at a diſtance, appears to be about a quarter of a mile in height, and above half a mile in breadth. No plants grow upon it, except a few without fruits, like thoſe on the tops of the Alps. Its ſides are ſtreaked with numerous furrows, widening and deepening as they approach the bottom, and formed by the rains, which eaſily corrode and excavate a ſubſtance ſo ſoft and yielding as pumice. The ſea at the bottom has likewiſe occaſioned great devaſtations, by means of which is laid open to view a large vein of horizontal lava, on which the laſt wave dies away when the ſea becomes calm. The formation of this lava was, therefore, prior to the vaſt accumulation of pumices which reſt upon it. This maſs of pumice is an aggregation of numerous beds, or ſtrata, of pumices, ſucceſſively placed on each other, diſtinguiſhable by their colour and by their projection from the mountain. Some of theſe pumices are ſo compact that the ſmalleſt pore cannot be diſcerned, nor do they exhibit the leaſt trace of a filamentous nature. With a lens they appear to be an irregular accumulation of ſmall flakes of ice. Others are full of pores and vacuities of a larger ſize, uſually round; and their texture is formed by filaments, and ſtreaks, generally parallel to each other, and of a ſhining ſilvery whiteneſs. Of theſe pumices there are three kinds, which the people of Lipari dig for ſale. One kind is employed in poliſhing different ſubſtances, and the other two kinds are uſed in the conſtruction of arched vaults, and the corners of buildings. There are other kinds which merit the attention of the natural hiſtorian. In examining theſe pumices our author obtained the following reſults:

	1ſt Species of Campo Bianco.	2d Species.	3d Species.	4th Species.	Pumice of the rock of the caſtle of Lipari.
Silex	60.3	80	80	61	63
Alumine	23	6	4	22.7	24
Magneſia	6	3	2	6	5.6
Lime	6	4.7	4	5.8	3
Iron	3	4.8	5.3	3	2

Beyond Campo Bianco and its adjacent hills, riſes a mountain of another kind, called the Monte della Caſtagna, which, in the part of it deſcending to the ſea, is about one mile in extent, and above four miles in circumference. This mountain, according to Dolomieu and our author, is entirely compoſed of enamels and glaſſes. For the deſcription of theſe in their number and variety, we muſt refer the reader to the work before us. Campo Bianco and the Monte della Caſtagna, though apparently iſolated, are in reality a connected group, taken in its whole extent, having a circuit of eight miles; nor is the extent of its vitrifications leſs, if in theſe we include likewiſe the pumices, which are in fact only a leſs perfect glaſs. The ſterility of theſe mountains is a conſequence of their vitreous nature, which, in the courſe of ſo many ages, has not been decompoſed into a vegetable earth: if we except a few lichens attached to the fiſſures of the glaſſes, there is no veſtige of a ſingle living vegetable over the whole Monte della Caſtagna; and on Campo Bianco they are extremely rare. Beyond the pumices, the lavas again appear, beginning from the "Punta del Segno Nero," and extending in a chain of ſeveral miles, which on the ſide of the ſea deſcends in precipices and craggy declivities: and proceeding further, the ſea makes an incurvature and forms a ſmall bay, called the Valle di Muria, on the ſides of which riſe high and ſteep rocks of lava, half demoliſhed, and among the lava enamels and pumices. In examining the interior of the iſland, Monte San Angelo, ſituated to the north of the city of Lipari, is the higheſt mountain, on the ſummit of which is a circular plain, ſurrounded by eminences ſhelving towards the inſide, which M. Dolomieu imagined to be the remains of an ancient crater, and which he ſuppoſes to have been the firſt that was formed in the iſland, about a mile above the ſea, through which the volcano burſt forth, and which ſerved as a baſe and ſupport for the other mountains that were thrown up afterwards. Soon afterwards roſe its companion, the Monte della Guardia, which looks towards the ſouth, and little inferior to the other in height. Theſe two mountains formed two iſlands in the ſea, which, enlarging each its reſpective baſe, united into one. To theſe two mountains ſubſequent eruptions made new additions, until at length the whole iſland of Lipari was produced, which, from the eroſions of the rain and ſea, is now certainly leſs than it once was.

Lipari, if we except ſome few flat places and practicable declivities, which the inhabitants have rendered cultivable by great labour, is a ruinous pile of horrid precipices, rugged cliffs, and enormous maſſes; and there is no ſummit, nor projecting part of a mountain, which does not exhibit manifeſt indications of its future fall and deſtruction. The materials of which theſe ruins are formed are pumices, enamels, and glaſſes, ſimilar to thoſe which we have already mentioned.

The celebrated ſtoves of Lipari have exerciſed the curioſity of travellers. Theſe lie four miles W. of the city, and ſomewhat beyond the ſummit of a mountain, which, next to thoſe of San Angelo and della Guardia, is one of the higheſt in the iſland. The road from the city to the ſtoves is formed by a deep excavation, chiefly the work of rain-waters, in an immenſe maſs of tufa. Our author conceives that the volcanic tufas have been formed by ſlimy eruptions; without denying, however, that aſhes, ſand, and other ſubtile matters ejected by volcanoes, and penetrated either by the rain-waters, or thoſe of the ſea, where they covered the baſes of the burning mountains, have been conſolidated into ſome tufas. The tufa of Lipari, to which we now refer, has every appearance of having been an earthy current in our author's opinion. It begins at about 100 paces from the city, and continues, without interruption, to beyond the ſummit of the Monte della Stufa, or Mountain of the Stoves. (See TUFA.) The ſtoves, terminating a deſcent of about 200 feet in length, form a group of four or five caves, more like to the dens of bears than the habitations of men, and exhibiting much leſs art than the edifices formed by the beaver. Every cave has an opening at the bottom, through which the warm and tumid vapours enter, and another in the top, through which they paſs out. On one of theſe ſtoves the thermometer ſtood at only 48$\frac{2}{3}$°; but the vapour poſſeſſes ſomewhat of a ſuffocating nature. The ſtoves now retain little more than their name, and whatever may have been their ſuppoſed virtue in the cure of diſorders, they are now nearly deſerted. Under the ſtoves, and the adjacent ground, there is reaſon to believe, that ſome remains of ſulphureous conflagrations ſtill continue.

Lipari, we have already obſerved, is the largeſt, and it is alſo the moſt populous of thoſe called the Æolian iſles; the number of its inhabitants amounting to between nine and ten thouſand, moſt of whom reſide in the city of the ſame name. If the iſland be divided into four parts, about 2½ will be found to be cultivated, and the remainder overgrown with wood, and barren. Theſe barren tracts, however, are gradually converted into fruitful fields, from a kind of neceſſity ariſing from the continually increaſing population of the iſland. Lipari produces cotton, pulſe, and olives, in ſmall quantities. The corn is ſcarcely ſufficient for the ſupply of the city. The principal of the uſeful productions of this iſland are the grapes, of which there are ſeveral kinds. The firſt furniſhes the common wine that is drank in the iſland, and of which they export annually two or three thouſand barrels. The paſſole and paſſolina, as they are called in the iſland, are two other kinds of grapes that are dried. The laſt is that ſort which is uſually called the Corinthian grape. Of this they commonly ſell 10,000 barrels annually; and of the other about 12,000. From a fourth kind of grape is made the famous Malmſey of Lipari; which is a wine of a clear amber colour, generous and ſweet. The grape producing this wine is ſcarce, and does not furniſh more than 2000 barrels annually, which are ſold for foreign markets, as well as the paſſole and paſſolina. The vintage is in the month of September, which is a ſeaſon of relaxation and feſtivity to the Lipareſe. Another plant of domeſtic uſe to the Lipareſe, if it does not form a branch of foreign commerce, is the Indian fig (Cactus opuntia, Linn.) Nothing can be more wretched than the fiſhery of Lipari. In June and July they fiſh for coral; but owing to a want of ſkill, this fiſhery is very unproductive. At Lipari large and ſmall cattle are very ſcarce; and the few oxen and cows which are ſlaughtered there are brought from Sicily, and are very lean. Of wild quadrupeds, the country only produces rabbits, which make their burrows in the mountainous parts, where the volcanic matters, principally of the tufaceous kind, permit them to dig with their feet. The birds ſtationary here are but few, *viz.* the partridge, green-finch, ſparrow, gold-finch, horn-owl, and raven. Of migrating water-fowls, here are different kinds of ſea-gulls and the cormorant. The birds of paſſage are the turtle-dove and the quail, which come for a few days in April and September. Several kinds of ſwallows are common.

Foreign commerce has begun to be introduced into the iſland by the mariners; they every year buy, at the fair of Sinigaglio, linen, muſlins, veils, and other commodities of that kind; and ſell them at Meſſina, Catania, Palermo, and other parts of Sicily. The trade is very advantageous to the country, and many have acquired conſiderable wealth; though it injures the fiſhery and raiſes the price of fiſh. Strabo, Diodorus, and Dioſcorides ſay, that the ſulphate of alumine (alum) was procured in great abundance at Lipari; but none of this ſalt is now extracted in the iſland.

The political adminiſtration of Lipari is compoſed of a criminal judge, a fiſcal, a governor, who has the chief authority both in military and civil affairs, and who is commonly an old invalid; and a civil judge. The biſhop, ſeventeen canons of the firſt order, and fourteen of the ſecond, and from 120 to 130 prieſts, form the eccleſiaſtical eſtabliſhment. The Lipareſe are, in general, of a prompt and lively wit, ready to learn, of acute penetration, and very deſirous of obtaining knowledge. A beggar is ſcarcely ever found in this iſland; for the pooreſt perſons have ſome ſmall piece of ground which they cultivate, and by the produce of which they live. The natives are rather of a large ſize, robuſt, and comely. The heat of the ſun, however, injures their fine complexions, producing tanned ſkins and ſwarthy countenances. The Lipareſe, in general, value themſelves upon being good mariners, both in theory and practice. Spallanzani's Travels in the Two Sicilies, &c.

Lipari, an ancient city of the above iſland, forming an amphitheatre along the ſhore, with a chain of mountains behind it, not of an extenſive circuit, and conſiſting rather of narrow alleys than ſtreets. The caſtle is ſurrounded with a wall, on which are erected a few cannon, and is defended by a ſmall garriſon. The houſes are indifferent buildings; but three edifices are diſtinguiſhable from the reſt; *viz.* the palace of the biſhop, the houſe of the governor, and the cathedral church. The latter contains very coſtly ſacred utenſils, a great quantity of plate, and a number of ſilver images, among which is the ſtatue of St. Bartholomew, their patron ſaint. The value of this treaſure is ſaid to amount to 90,000 Neapolitan ſcudi; the ſcudi being worth about 4*s.* 3*d.* N. lat. 38° 35′. E. long. 15° 12′.

LIPARIA, in *Botany*, ſo named by Linnæus, in his ſecond *Mantiſſa*, in alluſion either to the ſmooth or ſleek habit of L. *ſphærica*, from which his idea and character of the genus was taken, or to its rich and ſplendid appearance, for the Greek word λιπαρος will juſtify either explanation. Profeſſor Martyn gives the former; we prefer the latter.—Linn. Mant. 156. Schreb. 499. Willd. Sp. Pl. v. 3. 1114. Mart. Mill. Dict. v. 3. Thunb. Prodr. 123. Ait. Hort. Kew. ed. 1. v. 3. 48. Juſſ. 353.—Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, very obtuſe at the baſe, divided half way down into five acute ſegments, the lowermoſt of which is very long, elliptical, and reſembling a petal. *Cor.* papilionaceous, without any ſpurs or elongations to the keel or wings. Standard oblong, folded, ſtraight, reflexed at the ſides. Wings oblong, ſtraight, narrower at the baſe, two-lobed at their inferior margin. Keel lanceolate, ſlightly aſcending, divided deeply at the baſe. *Stam.* Filaments in two diſtinct ſets; one ſimple; the other in nine diviſions, which are thread-ſhaped, three of them ſhorter than the reſt; anthers ovate. *Piſt.* Germen ſeſſile, very ſhort; ſtyle thread-ſhaped, of a moderate length; ſtigma ſimple. *Peric.* Legume ovate. *Seeds* few.

Eſſ. Ch. Calyx in five ſegments, the lower one elongated. Wings of the corolla two-lobed at the lower ſide. Three of the united ſtamens ſhorter than the reſt. Legume ovate.

This ſplendid genus of ſhrubs, from the Cape of Good Hope, is in every reſpect cloſely allied to *Borbonia*, next to which it ought to ſtand in the Linnæan ſyſtem, though Murray, who has been heedleſsly followed by others, widely ſeparated them. *Liparia* differs from *Borbonia* in being truly diadelphous. How far the other characters indicated in their deſcriptions hold good, we have not ſufficient acquaintance with all the ſpecies of either genus to determine, but there is no difference with regard to habit or appearance. Two ſpecies are deſcribed by Linnæus, Mant. 268, 269, and four more indicated with doubt, amongſt which is *Spartium capenſe*, (*Crotalaria oppoſita*, Linn. Suppl. 322.) The reſt ſtand as *Liparia* in Syſt. Veg. ed. 14. 665, making five in all, to which eight are added by Thunberg, and the whole thirteen are admitted by Willdenow. The habit of the genus is rigid, with numerous, ſcattered, ſharp, uſually elliptical, rarely linear leaves, which are either ſmooth, hairy, or ſilky. Flowers, as far as we know, of a fine rich yellow, in terminal heads or umbels. Examples are

L. *ſphærica*. Linn. Mant. 268. Andr. Repoſ. t. 568. Curt. Mag. t. 1241.—Flowers numerous, in bracteated drooping heads. Leaves elliptic-lanceolate, ribbed, ſmooth.—According to Andrews this was raiſed by Mr. Milne, gardener at Fonthill, Wilts. We received it from Mr. Anderſon, curator of the ſplendid collection of James Vere, eſq. at Kenſington Gore. The *ſhrub* is five or ſix feet high, clothed with numerous, ſpreading or recurved, glaucous *leaves*, above an inch long, entire, and ſtrongly ribbed. The large drooping round heads of golden *flowers*, are ſingularly magnificent, accompanied by numerous reddiſh *bracteas*, differing from the leaves chiefly in colour and ſituation. The whole plant unavoidably turns as black as ink in drying. It bloſſoms in May.

L. *graminifolia.* Linn. Mant. 268.—Flowers capitate. Calyx hairy. Leaves linear-lanceolate, ſmooth.—Grows in a ſandy ſoil at the Cape. We have ſeen it in a dry ſtate only, nor is any figure extant. The very narrow *leaves*, an inch or inch and a half long, and about a line wide, are peculiar, as well as the hairy heads of *flowers*, much ſmaller than thoſe of the foregoing. The *branches* are angular and ſmooth.

LIPARIS, a name given by ſome authors to the pinguicula, butter-wort, or Yorkſhire ſanicle.

Liparis, in *Ichthyology*, a ſpecies of *Cyclopterus ;* which ſee.

Liparis *Noſtras*, the name of a ſmall fiſh, common on the coaſts of Yorkſhire, and ſome other parts of England, and called in Engliſh the ſnail, and limax marinus by ſome authors. It is about five fingers long ; on its back and ſides it is of a bright brown, and on the belly of a fine white : theſe are its colours, when freſh taken, for when it has been kept ten or twelve hours, the whole ſurface of the body, except the fins, becomes of a paler and bright brown. The head is thick, and not flat, but rounded ; it has no teeth, but its jaws are both rough like files.

The whole fiſh, head as well as body, is very ſoft and unctuous, and eaſily melts into a ſort of oily liquor. It is caught principally at the mouths of great rivers where they open into the ſea.

LIPAROCELE, from λιπος, *fat*, and κηλη, *a tumour*, in *Surgery*, any kind of tumour compoſed of fat.

LIPAVINA, in *Geography*, a town of Croatia ; 12 miles E.N.E. of Creutz.

LIPCZANI, a town of Poland, in the palatinate of Braclaw ; 60 miles W.S.W. of Braclaw.—Alſo, a town of Moravia, on the Pruth ; 24 miles S.S.E. of Choczim.

LIPENIUS, Martin, in *Biography*, a German Lutheran divine, known only by his works, which are "On the Navigation of Solomon's Ships to Ophir," 1661 ; "A Treatiſe on Chriſtmas-Boxes or New-Year's Gifts :" but his moſt important work is entitled "Bibliotheca Realis," in 6 vols. folio ; conſiſting of a view of all the ſubjects into which the different ſciences ars branched, with a catalogue of the names and works of the various authors who have treated concerning them. Moreri.

LIPES, in *Geography*, a town of Peru, and capital of a juriſdiction, under the viceroy of Buenos Ayres ; 150 miles S.S.W. of Potoſi. S. lat. 21° 40′. W. long. 68° 16′.

LIPETSK, a town of Ruſſia, in the government of Tambov, on the Voronez ; 40 miles W.N.W. of Tambov. N. lat. 53°. E. long. 40° 24′.

LIPETZ, a town of Bohemia, in the circle of Koniggratz ; 9 miles S. of Neu Biezow.

LIPINSKOI, a town of Ruſſia, in the government of Novgorod ; 16 miles S.E. of Novgorod.

LIPNISKI, a town of Lithuania, in the palatinate of Wilna ; 20 miles E.N.E. of Lida.

LIPNITZ, a town of Bohemia, in the circle of Czaſlau ; 6 miles W. of Teutſch-Brod.

LIPNO, a town of the duchy of Warſaw ; 12 miles N. of Dobrzyu.

LIPODERMUS, or Leipodermos, (from λειπω, *to leave*, and δερμα, *the ſkin*,) in *Surgery*, wanting the prepuce.

LIPORANO, in *Geography*, a town of Naples, in the province of Otranto ; 3 miles S. of Tarento.

LIPOTHYMIA, or Lipopsychia, in *Medicine*, from λειπω, *deficio*, and θυμος, *animus*, or ψυχη, *anima*, ſignifies a ſudden faintneſs, or temporary deficiency of the nervous power, and of all the functions depending upon it. It is called alſo *deliquium animi*, ſwooning, ſyncope, &c. See Syncope.

LIPOWE, in *Geography*, a town of Lithuania ; 25 miles N.N.E. of Braclaw.

LIPOWIEC, a town of Auſtrian Poland, on the Viſtula, to which belongs a caſtle on a rock, uſed as a priſon for eccleſiaſtical offenders ; 20 miles W. of Cracow.

LIPPA, a town of Hungary, on the Maros ; 22 miles N. of Temeſwar.

LIPPE-Shaumberg, William, *Count*, in *Biography*, ſon of Albert Wolfgang, count Lippe and Shaumberg, by a daughter of count Oynhauſen, was born in 1724 at London, but was ſent, in 1735, to Geneva, to complete his education. Here he devoted much of his time to the ſtudy of mathematics, as connected with the military art. In 1740 he returned with his brother, and in the following year they were both ſent to the univerſity of Leyden, from which they removed in a ſhort time to Montpellier, in France. At the age of eighteen he repaired to England, and obtained an enſign's commiſſion in the firſt regiment of guards. On the death of his eldeſt brother he returned to Buckebourg, the family reſidence, in Germany, and ſoon after accompanied his father, a lieutenant-general in the Dutch ſervice, during the campaign in the Netherlands, and was preſent as a volunteer at the battle of Dettingen, where he was diſtinguiſhed as well for his good conduct as for his bravery. In the year 1745 he joined the Auſtrian army in Italy, and was promoted, in conſequence of his ſervices, to be a colonel in the Auſtrian army, but he declined acting under the commiſſion. In 1746 he travelled over a conſiderable part of the continent, and from thence he came to England, where he remained till he ſucceeded to his paternal eſtates in 1748, when he repaired to Berlin, to ſurrender into the hands of his Pruſſian majeſty the order of the Black Eagle, which had been conferred on his father. Here he formed an acquaintance with many perſons of diſtinguiſhed literary merit, and he was elected a member of the Academy of Sciences. After this he was diſtinguiſhed as a military man in the Pruſſian army, raiſed a regiment of grenadiers from among his own ſubjects, and was honoured by Frederic with the order of the Black Eagle. In 1754 he eſtabliſhed a foundery at Buckebourg, where he had all the cannon caſt which he afterwards employed in the ſeven years' war againſt the French. In 1756 he entered into a treaty with Great Britain, by which he engaged to aſſiſt his Britannic majeſty in the defence of his German dominions againſt the arms of the French, and to furniſh for that purpoſe a regiment of infantry of a thouſand men, a corps of artillery, and another of carbineers and chaſſeurs. He was preſent at the battle of Minden, and in many other poſts of much danger. In 1758 he was ordered to withdraw his forces from the allied army, and join the Auſtrians againſt the king of Pruſſia: he refuſed, though at the riſk of being put under the ban of the empire, and continued faithful to the engagements which he had entered into with England. In 1759 the count obtained the command of the whole artillery of the allied army; took a conſiderable ſhare in the battle of Todenhauſen, and the ſucceſs of the day was in a great meaſure owing to the artillery of which he had the command. He was in the ſame year ſucceſsfully engaged in the ſieges of Marpurg and Munſter. On his return home, in 1760, he formed an artificial iſland in the Steinheeder lake, which is a mile in length, and half a mile broad, and being ſurrounded by moraſſes, is without the reach of cannon. Here he conſtructed a fortreſs, which was conſidered as impregnable, and it contains, beſides the uſual apartments, a chapel, and a library furniſhed with the beſt books on engineering, a collection of models, another of natural curioſities, and lodgings for the officers, with a ſchool for engineers, and an obſervatory. In 1761, when the war broke out between Spain and Portugal, count Lippe was appointed by his Britannic majeſty as commander-in-chief of the Britiſh troops ſent to the aſſiſtance of the latter. He was afterwards entruſted with the command of both armies, and in 1762 proceeded, by way of England, to Portugal. Soon after his arrival, the king ordered the ſum of forty thouſand cruſadoes to be paid him for his eſtabliſhment, but he immediately diſtributed one-half of the money among the ſoldiers, and ſent back the remainder, except what was ſufficient to pay for his uniform of field-marſhal, to the king. His majeſty even offered him a penſion of 3000*l.* but this the count declined, and nothing could induce him to accept of that remuneration of his ſervices to which he was unqueſtionably entitled. By his exertions principally, Portugal was protected from the danger threatened to it by her powerful and ambitious neighbour. The king of Portugal, Joſeph I. who knew how to appreciate count Lippe's talents, employed him in a civil as well as military capacity, and, in conſequence of his advice, introduced many improvements into the political adminiſtration of the kingdom, and particularly into the financial department. His principal object was to eſtabliſh the army on a reſpectable footing, and to inſpire the ſoldiery with a more delicate ſenſe of honour. The war which he carried on with Spain was merely a defenſive one, but he effected more by it than he could by one of a contrary deſcription, as he was enabled to throw ſo many obſtacles in the way of the enemy, that their plans were rendered entirely fruitleſs. In 1763, before he left Portugal, he eſtabliſhed a ſchool of artillery, and conſtructed on the Spaniſh frontier a very ſtrong fortreſs, which, in commemoration of his name, was called Fort Lippe. At the general peace the count returned to Germany, carrying with him abundance of preſents from the kings of Portugal and England, in teſtimony of their eſteem and approbation. He now employed much of his time in the ſtudy of the military art, and in bringing his theories to the teſt of practice. As the reſult of his experience and obſervations, he wrote a treatiſe on the art of defenſive war, in ſix ſmall volumes, which is ſaid to poſſeſs much merit, but of which he had only ten copies printed. In 1767 he reviſited Portugal by the king's invitation, and completed the reform which he had begun in the Portugueſe army. In the following ſpring he returned to Germany, and ſoon after was honoured with a viſit from Frederic II. of Pruſſia. The remainder of his life he employed in promoting the proſperity of his ſtates, and the happineſs of his ſubjects. He died in 1777, in the fifty-fourth year of his age. Sublime thoughts and heroic ſentiments had been as familiar and natural to his mind as they were to the nobleſt characters of Greece and Rome. The animation of his features announced the elevation, ſagacity, penetration, kindneſs, virtue, and ſerenity of his ſoul. In his retirement he amuſed himſelf with the arts and ſciences, but his favourite ſtudies were philoſophy and ancient hiſtory. He poſſeſſed an extenſive knowledge in every department of literature, and by his travels in foreign countries he had become familiarly acquainted with the French, Engliſh, Italian and Portugueſe languages: he was an excellent draftſman, a great connoiſſeur in paintings; and excelled ſo much in muſic, that he was able to direct the concerts which were given in the evening at his reſidence. Gen. Biog.

Lippe, in *Geography*, a county of Germany, W. of the biſhopric of Paderborn, divided into ſeveral branches, which derive their names from the different towns and parts of the principality belonging to each. The country, generally mountainous, contains ſome good arable land. Its chief towns are Detmold and Lemgow, and the principal rivers are the Emmer and the Werra. It now forms a part of the kingdom of Weſtphalia.—Alſo, a town of Weſtphalia, called *Lippſtadt*, on a river of the ſame name; 14 miles W. of Paderborn. N. 51° 39′. E. long. 8° 24′.

LIPPEHNE, a town of the New Mark of Brandenburg; 26 miles N. of Cuſtrin. N. lat. 53° 4′. E. long. 15° 3′.

LIPPI Fra. Filippo, in *Biography*. Concerning the exact date when the birth of this very excellent hiſtorical painter took place, authors differ extremely. The moſt probable account fixes it about the beginning of the fifteenth century, as he was a ſcholar of, and of courſe nearly contemporary with, Maſſaccio. At the age of ſixteen, being entered a noviciate in the convent of Carmelites at Florence, where he was born, he had there an opportunity of ſeeing that extraordinary artiſt at work upon the aſtoniſhing freſcoes with which he adorned the chapel of Brancacci, in the church there; and became eager to embrace the art he ſaw capable of ſo much effect in affording gratification, inſtruction, and intereſt to the mind.

Such was his ſucceſs, and ſo did he enter into the principles and manner of his great maſter, that after the death of the latter, it was ſaid, by common conſent, that the ſoul of Maſſaccio ſtill abode with Fra. Filippo.

He forſook the habit of his convent, and devoted himſelf entirely to painting; but his ſtudies were for a time diſturbed by his being unfortunately taken, while out on a party of pleaſure, by ſome Moors, and carried priſoner to Barbary; where he remained in ſlavery 18 months. He obtained his liberty by his talents. He drew the portrait of his maſter upon a wall with ſo much ſpirit and accuracy in reſemblance, that he, being ſtruck with the ingenuity of his ſlave, and generouſly feeling compunction in confining a man of ſuch uſeful talents, gave him his freedom as a reward.

On his return home he painted ſome works for Alphonſo, king of Calabria. He employed himſelf alſo in Padua; but it was in his native city of Florence, that his principal works were performed. He was employed by Coſmo di Medici; who preſented his pictures to his friends; and one to pope Eugenius IV. He was alſo employed to adorn the palaces of the republic, the churches, and many of the houſes of the principal citizens; among whom his talents were held in high eſtimation.

The holy mode of life into which he was conducted in early years, and the fine endowments of mind which he enjoyed by nature, did not teach him the folly of vice; and he met in this world with a ſevere puniſhment, juſtly due to a guilty amour he indulged in at Spoleto; where he was employed at the cathedral to paint the chapel of the Bleſſed

Virgin. There, in his ſixty-ſeventh year, he was poiſoned by the relations of the lady whoſe favours he was ſuppoſed to enjoy. Lorenzo di Medici erected a marble tomb in the cathedral to his memory, which Angelo Politiano adorned with a Latin epitaph.

Lippi Filippo, ſon of the former, was renowned for excellent imitations of architectural ornaments. He died in 1505, at the age of 45.

Lippi Lorenzo, alſo a Florentine painter, born in 1606. He was likewiſe a great muſician and a poet. In the latter character he publiſhed "Il Malmantile racquiſtato." He died in 1664.

LIPPIA, in *Botany*, was ſo named by Houſtoun, in honour of Auguſtine Lippi, a French botaniſt, as we learn from Linnæus's *Critica Botanica*, p. 93. He is alſo mentioned by *Boehmer*, in his diſſertation *de plantis in cultorum memoriam nominatis*, as having travelled into Egypt, and as having died in Abyſſinia.—Reliq. Houſt. 6. Linn. Gen. 322. Schreb. 399. Willd. Sp. Pl. v. 3. 356. Mart. Mill. Dict. v. 3. Michaux Boreal. Amer. v. 2. 15. Jacq. Amer. 176. Juſſ. 109. Lamarck Illuſtr. t. 539. Gærtn. t. 56.—Claſs and order, *Didynamia Gymnoſpermia*. Nat. Ord. *Stellatæ*, Linn. *Vitices*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of two diſtant, acuminated, keel-ſhaped, erect, permanent leaves. *Cor.* of one petal, unequal; limb divided into four ſegments, the upper and lower ones larger, the upper one erect. *Stam.* Filaments four, ſhorter than the corolla, two of them ſhorter than the reſt; anthers ſimple. *Piſt.* Germen ſuperior, ovate, compreſſed or flattiſh; ſtyle thread-ſhaped, ſtanding between the ſtamens, and of equal length; ſtigma oblique. *Peric.* none, except the permanent calyx in which the ſeeds are enveloped. *Seeds* two, adhering together, ovate, ſomewhat bony, convex on one ſide, rather ſmooth, flat on the other ſide, or ſomewhat concave, whitiſh.

Eſſ. Ch. Calyx four-toothed, two-valved when mature. Corolla funnel-ſhaped, four-cleft. Seeds enveloped in the calyx.

1. L. *americana.* Linn. Sp. Pl. 883. Reliq. Houſt. t. 12.—Heads of flowers forming a pyramid. Leaves ovate, ſerrated.—Found by Dr. Houſtoun at Vera Cruz, and cultivated by Mr. Miller before 1733.—This is a *ſhrub* which riſes to a conſiderable height. *Stems* round, compreſſed at their joints. *Leaves* lanceolate, ovate, rugged. *Flowers* forming little oblong heads, about the ſize of a large pea

2. L. *hemiſphærica.* Linn. Sp. Pl. 883. Jacq. Amer. t. 179. f. 100.—Heads of flowers hemiſpherical. Leaves oblong, entire.—A native of South America.—*Stems* eight or ten feet high. *Branches* woody, bending down unleſs ſupported. *Leaves* oppoſite, two or three inches long, ſmooth. *Flowers* ſmall and white. The whole ſhrub is odorous and aromatic.

3. L. *hirſuta.* Linn. Suppl. 288. Willd. n. 2. (L. umbellata; Willd. n. 4. Cavan. Ic. 75. t. 174.)—Heads of flowers ovate. Leaves oblong, broad, ſerrated, downy beneath.—A native of Mexico and other parts of America.—*Stem* four-ſided, rough with white hairs. *Leaves* oppoſite, long, hairy above, downy and hoary beneath. *Flowers* ſmall.

From examining the Linnæan ſpecimen of L. *hirſuta*, ſent originally by Eſcallon, a pupil of Mutis, we are enabled to ſtate that L. *umbellata* of Willdenow and Cavanilles is not a diſtinct ſpecies. The *flowers* of that are ſaid to be of a deep yellow, and we find thoſe of *hirſuta* tinged with the ſame colour, in a dried ſtate. As the younger Linnæus ſaw it in no other condition, he appears to have gueſſed them to be white, but erroneouſly.

4. L. *cymoſa.* Willd. n. 5. Swartz. Prod. 93. Ind. Occ. v. 2. 1066. (Spirææ congener, ſpinoſa, &c. Sloan. Jam. v. 2. 30. t. 174. f. 3 and 4.)—Flowers in cymes. Leaves ovate, acute, nearly entire.—A native of woody ſavannahs, in the ſouthern parts of Jamaica, flowering in May.—*Stems* ſeveral from three to ſix feet high, about the ſize of a gooſe-quill. *Leaves* almoſt round, yellowiſh-green, ſmooth, ſcented like thoſe of Penny-Royal. *Flowers* many together, of the colour and ſomewhat reſembling thoſe of *Spiræa Theophraſti.*

L. *ovata.* Linn. Syſt. Veg. ed. 14. 574. Mant. 89, is properly referred by l'Heritier and Willdenow to *Selago.*—Michaux places *Verbena Nodiflora* of Linnæus in *Lippia*, though with doubt, and adds another ſpecies, L. *lanceolata*, which we preſume is nearly allied to *nodiflora*

LIPPIE, a corn meaſure in Scotland; four lippies being equal to one peck.

LIPPITUDO, (from *lippus*, blear-eyed.) The ſignification of this term, in *Surgery*, is rather indeterminate. Celſus attaches the ſame meaning to it as ophthalmy. Lippitude, or blearedneſs, according to Wiſeman, is a ſtate of the eyes, in which they are dimmed with rheum. We believe that, at preſent, ſurgeons generally underſtand by lippitudo a chronic inflammation of the ciliary glands, and of the edges and inſide of the eye-lids, attended with a ſecretion of viſcid matter, by which the eye-lids are glued together during ſleep, and cannot be opened in the morning without trouble, pain, and a copious emiſſion of tears. The caſe is frequently accompanied by more or leſs inflammation of the conjunctiva, and always by a weak impaired ſight. In bad caſes, the margins of the eye-lids are ſtudded with little ulcerations; the eye-laſhes fall off; and either an entropium or an ectropium taking place, the diſeaſe is rendered more complicated.

One of the beſt remedies for lippitudo is the unguentum hydrargyri nitrati, a ſmall quantity of which is to be applied once or twice every day to the edges and inner ſurfaces of the eye-lids. Care is to be taken that theſe parts are well ſmeared with the ointment, which ſhould be melted in a ſpoon, and applied by means of a camel-hair pencil. Several other ointments will anſwer the purpoſe, particularly ſuch as contain hydrargyrus nitratus ruber, tutty, Armenian bole, &c.; but that above recommended will always anſwer when others will, and very often ſucceeds when they will not. The effect of the ointment may frequently be advantageouſly promoted, by waſhing the eye ſeveral times a day with a collyrium, compoſed of roſe-water ℥viij and zincum vitriolatum, from gr. x to gr. xx, according to the ſenſibility of the organ.

Writers on ſurgery mention caſes of diſeaſe of the ciliary glands, which are ſaid to depend upon ſcrofula, a ſcorbutic habit, and the venereal diſeaſe. We cannot vouch for the accuracy of this ſtatement, but we think it certain that numerous inſtances are kept up by conſtitutional cauſes, which prevent the efficacy of local applications and ſimple methods, and often create a neceſſity for reſorting to internal as well as external treatment. In the examples alluded to, it was juſtly remarked by Mr. Warner, that the ordinary means will fail unleſs aſſiſted by proper regimen in diet, and alteratives of different kinds, ſuch as calomel, Plummer's pills, extractum cicutæ, alkaline abſorbents, decoctions of the woods prepared in lime-water, or common water, bark, vinum antimoniale, &c. Coſtiveneſs is at all times to be prevented. Warner alſo approves of applying, in certain caſes, bliſters to the head, neck, or betwixt the ſhoulders. He thought that they acted not only as ſtimulants and evacuants,

cuants, but as alteratives, by the cantharides being freely abſorbed into the circulation. He was likewiſe an advocate for iſſues. See Deſcript. of the Human Eye, and its principal Diſeaſes, by J. Warner, F.R.S. p. 13.

LIPPOMAN, Lewis, in *Biography*, a learned Italian prelate, deſcended from a noble Venetian family, flouriſhed in the ſixteenth century, but the time of his birth is not known. Being intended for the church, he purſued his ſtudies with ſo much diligence and ſucceſs, that he was conſidered one of the ableſt divines of his time: he was likewiſe diſtinguiſhed for his capacity for buſineſs. He acquired conſiderable reputation by his attendance at the council of Trent, and was fixed on by pope Julius III. as one of the three preſidents of that council. He went as nuncio into Germany, and was afterwards ſent in the ſame high capacity into Poland, by pope Paul IV. who made him his ſecretary. In Poland he was the unrelenting perſecutor of the Jews and Proteſtants; and by his zeal in defence of his own religion, he obtained, ſucceſſively, the biſhoprics of Verona, Modena, and Bergamo. As a writer he publiſhed "Catenas" of the Greek and Latin fathers, upon "Geneſis," "Exodus," and the "Firſt Ten Pſalms." He made alſo a new collection of "The Lives of the Saints," in eight vols. folio. He died in 1559, and is mentioned by De Thou as one equally illuſtrious for the purity of his principles, and the innocence of his life. Moreri.

LIPPSPRING, in *Geography*, a town of Weſtphalia, in the biſhopric of Paderborn, at the ſource of the Lippe; rendered famous by Charlemagne's obliging the Saxons to embrace Chriſtianity in this place, and holding in it three councils; four miles N. of Paderborn.

LIPRAZZO, a town of Naples, in Capitanata; 17 miles W.S.W. of Manfredonia.

LIPS, Labia, in *Anatomy*, the edge, or exterior part, of the mouth; or that muſculous extremity which ſhuts and covers the mouth, both above and below. See Deglutition and Lip.

Lips are alſo uſed to ſignify the two edges of a wound.

Lips, in *Geography*, a town and caſtle of Hungary; four miles N. of Neuſol.

LIPSE, or Lipsius, Justus, in *Biography*, a very eminent philologiſt and critic, was born at a village, near Bruſſels, in the year 1547. He ſhewed an early diſpoſition for the purſuits of literature, which was cultivated at the Jeſuits' ſchool in Cologne, whither he was ſent when he was about 12 years of age. From thence he went to Louvain, and engaged in the ſtudy of the civil law, ſtill retaining a ſtrong predilection for the belles lettres. His firſt work was entitled "Variarum Lectionum Libri Tres," which he dedicated to the cardinal Granvelle, who patronized him, and received him into his houſe at Rome, where he arrived when he was twenty years of age. He ſpent two years with the cardinal in the quality of Latin ſecretary, and employed every leiſure hour in collating MSS. in the Vatican and other libraries, and cultivating an acquaintance with the eminent ſcholars then reſiding in the metropolis. On his return to Louvain he paſſed ſome time in youthful gaieties, but becoming ſenſible of the danger of diſſipated habits, he reſolved to quit the ſcene, and viſit Vienna. In 1572 he accepted the profeſſorſhip of hiſtory at Jena, though a Lutheran univerſity: he quitted Jena in two years and went to Cologne, where he wrote his "Antiquæ Lectiones," conſiſting chiefly of emendations of Plautus; and at the ſame period began his notes upon Tacitus. After this he went to Louvain, and was created a doctor of laws: from thence he proceeded to Leyden, accepted the profeſſorſhip of hiſtory, and exchanged the Roman Catholic religion for that of Calviniſm. Here he ſpent thirteen of the moſt valuable years of his life, and obtained much reputation by the works which he publiſhed. Theſe were upon various topics, critical, hiſtorical, and philoſophical: but his commentaries upon Tacitus were particularly eſteemed by the learned. In two of his works, *viz.* "Politicorum Libri VI." and "De una Religione," he openly maintained the maxims that no ſtate ought to permit a plurality of religions, but ought to exerciſe the utmoſt ſeverity againſt all thoſe who diſſent from the church. Such ſentiments, carried to the extent in which he carried them, gave great offence to the government of this country, and he was glad to withdraw into Flanders for ſafety. There he abjured the Proteſtants, and joined the Catholics, with whom he lived the remainder of his life. He ſettled again at Louvain, and taught the belles lettres with great ſucceſs: he received liberal propoſals from various ſovereigns and other perſons of diſtinction to reſide under their protection, but preferred to continue at Louvain, where he publiſhed ſeveral works, ſome of which were not only of inferior merit, but diſplayed the weakneſs of a very ſuperſtitious mind; he did not ſcruple to give an account of the wonders and miracles performed at the ſhrines of two images of the Virgin Mary: in this he adopted every puerile and abſurd tale that he found current among the vulgar. Lipſius died at Louvain in 1606, in his fifty-ninth year. His works have been collected in ſix volumes folio, divided, according to their ſubjects, into ſacred hiſtory, Roman and foreign hiſtory, political and moral diſcuſſions, &c. He was a very able Latin ſcholar, and wrote commentaries upon Plautus, Tacitus, Valerius Maximus, Velleius Paterculus, and Seneca. Moreri. Bayle.

LIPSK, in *Geography*, a town of Lithuania, in the palatinate of Novogrodek; 28 miles W.S.W. of Sluck.—Alſo, a town of Poland, in the palatinate of Sandomirz; 30 miles N. of Sandomirz.

LIPSO, an iſland in the Grecian Archipelago, about eight miles in circumference; ſix miles S.S.E. of Patmos. N. lat. 37° 24'. E. long. 26° 23'.

LIPTOTES, in *Rhetoric*, a figure, wherein, by denying the contrary of what we intend, more is ſignified than we would ſeem to expreſs. Thus in the following verſe of Virgil.

"Quid prodeſt, quod me ipſe animo non ſpernis, Amynta."

See Voſſius, Rhet. lib. iv. p. 183.

LIPYRIA, in *Ancient Medicine*, λειπυρια, a term applied to thoſe varieties of continued fever, in which a burning heat was felt in the viſcera, while the extremities and external parts were cold. It was aſcribed by Galen and Aëtius to an eryſipelatous inflammation of ſome of the abdominal or thoracic viſcera. See Galen, Comment. 2. in Prog. & Com. ad Aph. 48. lib. iv.—Aët. Tetrab. 2. lib. ii. cap. 89.—Alſo Föeſii Œconom. Hippocrates.

LIQUAMEN Pyriticum, in *Natural Hiſtory*, a name given by ſome authors to the liquid matter remaining in the pans in which the common vitriol is made; after which no more of that ſalt will ſhoot. It is otherwiſe called liquamen of vitriol.

LIQUAMUMIA, a term invented by ſome of the diſpenſatory writers, to ſignify human fat.

LIQUEFACTION, an operation, by which a ſolid body is reduced into a liquid; or the action of fire or heat on fat, and other fuſible bodies, which puts their parts into a mutual inteſtine motion.

The liquefaction of wax, &c. is performed by a moderate heat, that of ſal tartari, by the mere moiſture of the air.

All ſalts liquefy; ſand, mixed with alkalis, becomes liquefied

quefied by a reverberatory fire, in the making of glaſs. In ſpeaking of metals, inſtead of liquefaction, we ordinarily uſe the word *fuſion*.

LIQUET. See Non Liquet.

LIQUID, a body which has the property of fluidity; and, beſides that, a peculiar quality of wetting other bodies immerged in it, ariſing from ſome configuration of its particles, which diſpoſes them to adhere to the ſurfaces of bodies contiguous to them. See Fluid and Liquidity.

Liquids, *Denſity of.* See Density.

Liquid *alum*, *amber*, *confects*, *laudanum*, *meaſures*, *ſtorax*, *ſulphur*. See the reſpective ſubſtantives.

Liquid, among *Grammarians*, is a name applied to certain conſonants oppoſed to mutes.

L, *m*, *n*, and *r*, are liquids. See L, M, N, &c.

LIQUIDAMBAR, in *Botany*, from *liquidum*, fluid, and *ambar*, a fragrant ſubſtance, generally taken for ambergriſe; alluding to the aromatic liquid gum which diſtils from this tree. Linn. Gen. 499. Schreb. 649. Willd. Sp. Pl. v. 4. 475. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 365. Juſſ. 410. Lamarck Illuſtr. t. 783. Gærtn. t. 90. Michaux Boreal-Amer. v. 2. 202.—Claſs and order, *Monoecia Polyandria*. Nat. Ord. *Amentaceæ*, Linn. Juſſ.

Gen. Ch. Male flowers numerous, in a long, conical, looſe catkin. *Cal.* a common involucrum of four ovate, concave, deciduous leaves, the alternate ones ſmaller. *Cor.* none. *Stam.* Filaments numerous, very ſhort, in a maſs which is convex on one ſide, flat on the other; anthers erect, of two lobes and two cells, with four furrows.

Female flowers collected into a globe, at the baſe of the male catkin. *Cal.* an involucrum, as in the male, but double, the proper perianths being ſeveral within it, connected together, bell-ſhaped, angular, warty. *Cor.* none. *Piſt.* Germens two, ſuperior, united to the perianth and to each other; ſtyle to each ſolitary, long, awl-ſhaped; ſtigma recurved, downy. *Peric.* Capſules two, coriaceous, beaked, of one cell, opening at the inner edge. *Seeds* ſeveral, oblong, compreſſed, ſhining, with a membranous point.

Eſſ. Ch. Male, Catkin with a four-leaved involucrum. Corolla none. Stamens numerous.

Female, Catkin globoſe, with a four-leaved involucrum. Perianth of one leaf, pitcher-ſhaped, two-flowered. Corolla none. Styles two. Capſules two, ſurrounded by the perianth at their baſe, each of one cell, with many ſeeds.

1. L. *ſtyraciflua.* Maple-leaved Liquid-amber, or Sweet Gum. Linn. Sp. Pl. 1418. Duhamel Arb. v. 1. 366. n. 1. t. 139. Sm. Inſ. of Georgia, t. 48. Ehrh. Pl. Off. 129—Leaves palmate, ſerrated, acute; veins hairy at the baſe of their ramifications.—Native of ſwampy ground in moſt parts of North America, near rivulets. It is a tall, ſtraight, and handſome *tree*, with a round head of alternate, ſtalked, elegant and ſhining *leaves*, palmate like ſome kinds of maple, ſmaller than thoſe of the Plane. *Flowers* terminal; the male a ſtalked, hairy, branched, conical catkin, or rather perhaps a cluſter of globoſe flowers, nearly a finger's length; female a globular head, on a long ſimple bracteated ſtalk, ſpringing from the baſe of the former. *Fruit* ſmaller than that of the Plane, beſet in every direction with the long prominent points of the capſules. This tree is hardy in our gardens, and very ornamental, changing in autumn to various rich hues of red and orange, but does not bloſſom in Europe, at leaſt not till it is very old. The gum, which exudes from any wounds in the trunk, in the warmer parts of its native climate, is ſeldom produced here. We have once collected it from a tree in Kew garden. Its ſcent is very fragrant and agreeable, like Benzoin or Storax.

2. L. *imberbis.* Oriental Liquid-amber. (L. orientalis; Mill. Dict. ed. 8. n. 2. Platanus orientalis; Pocock's Travels, v. 2. t. 89. *Willd.*)—Leaves palmate, bluntly crenate, or wavy, obtuſe; veins naked.—Native of the Levant. Seeds were ſent to France by Peyſonel, and ſome were forwarded to Miller, who raiſed plants from them at Chelſea. Whether any of theſe trees exiſt in England at preſent we know not. Some were to be ſeen at Paris 25 years ago, and probably ſtill remain. This ſpecies differs from the former in having ſmaller *leaves*, whoſe lobes, as well as their notches, are all blunt, their margins wavy, not ſerrated, and their veins nearly or quite deſtitute of all pubeſcence at their origin.

For L. *aſplenifolium* of Linnæus, a name which he afterwards changed, much for the worſe, to *peregrinum*, ſee Comptonia.

Liquidambar, in *Gardening*, compriſes plants of the hardy deciduous tree kind, of which the ſpecies cultivated are the maple-leaved liquidambar, or ſweet gum (L. ſtyraciflua;) and the oriental liquidambar (L. imberbis.)

Method of Culture.—Theſe two plants are increaſed by ſeeds and layers. In the former mode the ſeed ſhould be ſown as ſoon as it is procured from abroad, in ſpring, in a bed of light earth, half an inch deep, when the plants will riſe ſome the ſame year and others not until the ſpring following, moderate waterings being occaſionally given, keeping them clean from weeds all ſummer, and protecting them from ſevere froſt the firſt two winters. When the plants are two years old, plant them out in ſpring, in nurſery rows, two feet aſunder, to remain three or four years, or till wanted for planting in the ſhrubbery, and other places. But ſome ſow the ſeeds in pots, or boxes, in order to move them to different ſituations as the ſeaſon requires; and when the plants do not come up the ſame year, the pots may be plunged in a hot-bed in the following ſpring, to forward their riſing.

In the latter, or layer method, the layers ſhould be made from the young ſhoots of the preceding ſummer, by ſlit-laying, when moſt of them will be rooted in the following autumn, though, in a dry poor ſoil, they are ſometimes two years before they are ſufficiently rooted for being removed to plant out.

Theſe trees have great merit for ornamenting ſhrubbery plantations, in aſſemblage with others of ſimilar growths, being handſome, ſtraight-growing trees, with fine heads, as well as adapted for planting detached as ſingle objects, in ſpacious ſhort graſs openings, in which they appear very ornamental, perfuming the air all round in the ſummer months. They ſucceed in any common ſoil and ſituation, and endure the ſevereſt cold without injury. They are uſually kept in the nurſeries for ſale.

LIQUIDATE *an Action.* See Action.

LIQUIDATION, the act of reducing and aſcertaining either ſome dubious diſputable ſum, or the reſpective pretenſions which two perſons may have to the ſame ſum.

Liquidation, the termination or winding up of accounts, ſuch as paying or receiving debts, &c.

LIQUIDITY, in *Chemiſtry*, one of the three ſtates of bodies between the ſolid and the aeriform ſtate. The liquid and elaſtic ſtates of bodies have the common denomination of fluids, hence the word fluid cannot be uſed to expreſs either of theſe ſtates particularly. Before the improvements in modern chemiſtry, the ſame explanation was applied to account for the properties of a liquid and an elaſtic fluid, under the general appellation of fluid; although bodies in each of theſe forms are differently conſtituted.

Sir Iſaac Newton and the philoſophers of his time ſuppoſed, that fluidity was occaſioned by the ſpherical form of the particles of the bodies by which they were ſuppoſed to move with facility in all directions. Since, however, the conſtitution of bodies in different ſtates is better underſtood, ſuch an hypotheſis is not neceſſary. Haüy has rendered it very probable, that the particles of bodies are of the form of their primitive cryſtals, which are flat-ſided ſolids of the ſame regular form.

When we recollect that the particles of bodies, in the moſt ſolid ſtate in which we find them, are far from touching each other, their ſpherical figure would not avail in giving them fluid properties, when they are changed into that form by the agency of heat.

Since bodies are found to expand by heat, and contract when the heat is withdrawn, it ſeems obvious, that the particles of bodies are acted upon by two forces; the one attraction, reſiding in the particles of the bodies; and the other, the repulſion of the particles of caloric for each; and which being combined with the attractive particles, give them the tendency to recede from each other, at the ſame time that the attraction is not altered.

The equilibrium, between the two forces, is kept up by the different diſtances of the particles, on which the relative volumes belonging to different temperatures depend. If we gradually raiſe a rod of tin, or any other metal, from the common temperature to its fuſing point, we firſt obſerve its progreſſive expanſion, by which we are to infer, that the coheſive force is diminiſhing in ſome ratio of the expanſion. When it has arrived at a certain temperature, the pillar of metal will loſe its form, and if it were not confined by the ſides, it would become extended into a ſheet of a thickneſs proportionate to its degree of fluidity. In other words, when the coheſion of the particles is ſo diminiſhed, as to be exceeded by the action of gravity upon the particles individually, the ſolid will aſſume the liquid form.

This hypotheſis perfectly explains all the phenomena attendant on the liquefaction of thoſe bodies which are not ſuſceptible of cryſtallization, ſuch as wax, reſin, tallow, and ſeveral other ſubſtances. Such bodies, we obſerve, firſt begin to ſoften by the partial loſs of coheſion, and gradually become more and more liquid, till the degree of the heat ſhall occaſion their decompoſition, or give them the elaſtic form.

Theſe bodies, as we ſhould expect, increaſe in volume to the point of extreme liquidity, and the ſolid maſs is of much greater ſpecific gravity than the liquid.

The claſs of bodies that are ſuſceptible of the cryſtalline form, which takes place at the point of liquidity, appears to depend upon ſome other cauſe than the mere preſence of caloric, and on that account will preſent many anomalies to the above theory. Theſe anomalies, however, are alone obvious at the point when cryſtallization is taking place. In ſome of theſe bodies, ſuch as water, we do not obſerve any medium between perfect ſolidity and almoſt perfect liquidity.

The ſolids are in general of leſs ſpecific gravity than the liquids, and conſequently float upon them. And it is obſerved, that the point of maximum denſity is at a higher temperature than the point of congelation. The greateſt denſity of water is, according to the enquiries of Dalton, at 36°, the point of congelation being at 32°. If, however, a maſs of water be cooled, while the veſſel holding it be kept at reſt, it may be reduced as low as 18°, and even 16°, without congelation, contracting in volume all the time. When, however, the veſſel is agitated by giving a tremulous motion to the table, the whole becomes inſtantly ſolid, with a certain degree of expanſion, and the temperature riſes to 32° at the ſame moment of time. It would therefore ſeem, that the contraction and expanſion by the preſence or abſence of caloric would be perfectly conſonant with the change of temperature, were it not for the interference of this myſterious law of cryſtallization.

The circumſtances under which the congelation of cryſtalline bodies takes place, clearly ſhews that ſomething more is wanting than the mere abſtraction of caloric. Salts are found to cryſtallize by ſtanding for a certain time, although the temperature and quantity of water remain the ſame. It would therefore appear, that the integrant particles require time to arrange themſelves; and that the ſalted form, as well as their regular form, is dependent on their arrangement: or that attraction of aggregation is the greateſt when the integrant particles are placed in one particular direction. And it appears, ſince the ſtrongeſt aggregation exiſts when the cryſtals are beſt formed, that the attraction cauſing ſolidity is the greateſt when the homologous ſides of the particles are parallel to one another, taking it for granted, that the particles are of the form of the primitive cryſtal.

The idea of a polarity in the particles of bodies is not new; and, from many recent facts, does not appear very gratuitous. Bodies which are magnetic or electrical, appear to be capable of arranging themſelves in ſuch order, that their poles ſhall be reverſed to each other, from the attractions of oppoſite poles. We have already a ſtriking inſtance of this electrical polarity in cryſtals of the *tourmalin*. And from ſome late experiments by Malus, it appears that even the particles of light are poſſeſſed of polarity, confirming what Newton had before conjectured.

When we apply heat to a ſolid cryſtalline body, ſuch as a piece of ice, caloric does not effect its liquefaction by removing its particles to a greater diſtance, becauſe the ice is not ſo denſe as the water; conſequently, the particles are nearer in the liquid than in the ſolid form. It would appear, in this inſtance, that the caloric had the power of leſſening, and perhaps deſtroying altogether, the polarity of the particles, an effect which is not more unlikely than that of a certain temperature deſtroying the polarity of a magnet.

When, however, the caloric is removed, the polarity may return, but this alone is not ſufficient to render the water ſolid. A certain time, with a certain degree of agitation, is neceſſary to allow the particles to aſſume their moſt favourable poſition for conſtituting the greateſt aggregation, and their greateſt regularity. We alſo ſhould infer, that during this change, in which much force is exerted, the particles occupy more ſpace, by which the expanſion is occaſioned. Similar effects take place in the congelation of moſt of the metals; and it will, doubtleſs, be found, that the ſolids of all bodies will be of leſs ſpecific gravity than their reſpective liquids, in proportion to the ſuſceptibility of cryſtallization, or, if we may be allowed the expreſſion, as the polar force of their particles.

The particles of thoſe bodies which are not ſuſceptible of cryſtallization may have little or no polarity, and hence may owe their ſolidification to the mere abſence of caloric. Their tranſition from the ſolid to the liquid form will be gradual and ſlow, and their hardneſs will be inverſely as the caloric they contain. This is not the caſe with cryſtalline bodies; their tranſition from the liquid to the ſolid form is governed by ſeveral circumſtances, and their hardneſs is not immediately in the inverſe ratio of their caloric, but more dependent upon their polar arrangement. In all probability, if it were not for this latter cauſe, the point of congelation would be much lower in the thermometrical ſcale. What we termed confuſed cryſtallization, may be a ſtate of ſolidity in which the poles of the particles are deranged.

The want of fluidity in liquids may depend upon two cauſes. In the liquids which are homogeneous, the fluidity will be more or leſs perfect, according to the temperature by which the attraction of coheſion becomes greater or leſs. In fluids which are liable to change in their properties by expoſure to the air, the want of fluidity ariſes from a ſubſtance being formed which is leſs fluid. This is the caſe with oils, both the fixed and volatile: ſuch fluids are ſaid to be tenacious. That the particles of liquids have ſtill conſiderable attraction for each other, is apparent from a fluid aſſuming the form of drops. The drops will be more or leſs ſpherical according to the fluidity, and the ſize of the globules will be inverſely as the denſity of the fluid. Hence we ſee the drops of ſulphuric acid ſmaller than thoſe of water, and the drops of mercury ſtill ſmaller.

That the attraction of the particles of liquids becomes leſs according to temperature, is obvious from the law of their expanſion. It is found that the increments of expanſion are greater than the increments of heat. Mr. Dalton is of opinion, that the expanſion of liquids is as the ſquare of the temperature, and has propoſed a new diviſion of the thermometrical ſcale agreeably to this law. The ſame law that obtains in liquids which are ſuſceptible of cryſtallization, will not probably hold good in other fluids, in which there does not appear to be any quick tranſition from ſolidity to liquidity. In order that the expanſion may be in the duplicate ratio of the temperature, it would be neceſſary that the attraction ſhould diminiſh in an equal degree with the increaſe of caloric. If the caloric, at the different points of time, be 1, 2, 3, &c. the attractions at the correſponding points ſhould be 1, $\frac{1}{2}$, $\frac{1}{3}$, &c. ſo that being inverted and multiplied into the increments of heat, they will make the increments of expanſion a ſeries of ſquares. The ſame law, according to Dalton, does not obtain in the expanſions of ſolids and elaſtic fluids. A ſeries of experiments, which would ſettle finally the relations between the increments of expanſion and temperature, in different bodies, would be of great importance.

LIQUOR. See Drink, Fluid, &c.

Liquor *Amnii*, in *Midwifery*, a clear pellucid fluid, or lymph, contained in the amnios, or inner membrane of the bag inveſting the fœtus while in the uterus. The quantity varies very much in different women, or in the ſame woman in different pregnancies. In ſome women, when at their full term of geſtation, there is not more of this fluid than three or four ounces, more commonly there are eight, ten, or twelve ounces; and in ſome rare caſes, in women of a leucophlegmatic diſpoſition, manifeſted by œdematous ſwellings of the legs, thighs, and labia pudendæ, two or three pints have been found. Its uſe appears to be to prevent the friction of the child againſt the amnios, or of the limbs of the child againſt each other, or againſt its body, which might occaſion an abraſion of the cuticle, and an unnatural coaleſcence of the parts. Its purpoſes, therefore, are the ſame as thoſe of the fluid found in the pericardium, and in all the cavities of the body in which any of the viſcera are contained. It was thought to ſerve the further purpoſe of affording aliment to the fœtus; but as children born without heads are found to be in other reſpects as perfect, as lively, ſtrong, and plump as thoſe with heads, it is evidently not neceſſary, at leaſt for that purpoſe. See Conception, and Embryo.

Liquors, *Fermented*. See Fermented *Liquors*.

Liquor, *Teſt*, among dealers in brandy. See Spirit, and Test-*liquors*.

Liquor *Aluminis Compoſitus*, in the *Materia Medica*. See Aqua *Aluminis Compoſita*.

Liquor *Ammoniæ*, or *Aqua Ammoniæ Puræ*, P. L. 1787. See Ammoniacal *Preparations*.

Liquor *Ammoniæ Acetatis*, *Aqua Ammoniæ Acetatæ*, P. L. 1787, is prepared by adding four pints of the acetic acid to two ounces of carbonate of ammonia, until bubbles of gas no longer ariſe, and then mixing. If the acid predominate, the ſolution is more grateful to the taſte, and if the acid be correctly prepared, the proportions above ſtated will be ſufficient; but where the ſtrength of the acid cannot be depended upon, it will be right to regulate them by the ceſſation of effervеſcence rather than by quantity.

Liquor *Ammoniæ Carbonatis*, *Aqua Ammoniæ*, P. L. 1787. *Spiritus Salis Ammoniaci*, P. L. 1745, is formed by diſſolving eight ounces of carbonate of ammonia in a pint of diſtilled water, and filtering the ſolution through paper. See Ammoniacal *Preparations*.

Liquor *Arſenicalis*, or *Arſenical Solution of Fowler*, *&c.* See Arsenic.

Liquor *Calcis*. See Lime-*water*.

Liquor *Cupri Ammoniati*, *Aqua Sapphirina*, P. L. 1745. See Copper.

Liquor *Ferri Alkalini*. See Iron, in the *Materia Medica*.

Liquor *of Flints*. See Flints.

Liquor *Hydrargyri Oxymuriatis* is prepared by diſſolving eight grains of the oxymuriate of mercury in fifteen fluidounces of diſtilled water, and then adding a fluid-ounce of rectified ſpirit. This ſolution is directed for the purpoſe of facilitating the adminiſtration of diviſions of the grain of this active medicine. Each fluidrachm contains $\frac{1}{16}$th of a grain of the ſalt. The ſpirit, though it aſſiſts, is not abſolutely neceſſary to the ſolution of this quantity, but it preſerves it afterwards, and prevents the vegetation of mucor, to which all ſaline ſolutions are liable.

Liquor *Mineralis Anodynus*, the name given by Hoffman to a liquor of his own invention, famous at this time in Germany, and ſuppoſed by Burggrave to be made in this manner: take oil of vitriol and Indian nitre, of each four ounces; diſtil the ſpirit gradually from this by a retort; pour two ounces of this ſpirit cautiouſly and ſucceſſively into fifteen ounces of ſpirit of wine highly rectified; diſtil this, and there comes over a very fragrant ſpirit. This is to be again diſtilled, to render it perfectly pure, adding firſt to it a ſmall quantity of oil of cloves, and a quantity of water, equal to that of the ſpirit; after this, as ſoon as the watery vapours begin to ariſe, the whole proceſs is to be ſtopped, and the ſpirit kept alone in a bottle well ſtopped. This has great virtues as an anodyne, diaphoretic, antiſeptic, and carminative. It is not certain that it is exactly the ſame with Hoffman's, that author having never publiſhed his manner of making it; but it appears the ſame to the ſmell and taſte, and has the ſame virtues.

M. Macquer ſays, that it is a mixture of very rectified ſpirit of wine, of ether, and of a little of the ſweet oil of vitriol; and that it is made by mixing an ounce of the ſpirit of wine, which riſes firſt in the diſtillation of ether, with as much of the liquor which riſes next, and which contains the ether, and afterwards by diſſolving in this mixture twelve drops of the oil which riſes after the ether has paſſed. This liquor has preciſely the ſame virtues with the ether which phyſicians now ſubſtitute for it. See Ether.

Liquor, *Boyle's fuming*. See Sulphuret *of Ammonia*, and Ammonia.

Liquor *Plumbi Acetatis*, and Liquor *Plumbi Acetatis Dilutus*. See Lead, *Extract of*.

Liquor *Potaſſæ*. See Lixivium *Saponarium*.

Liquor *Potaſſæ Subcarbonatis*. See Lixivium *Tartari*.

Liquor, or *Smoaking Spirit of Libavius*, or *Smoaking Muriat of Tin*, is a marine acid, or ſuper-oxydated muriat of tin, very concentrated, ſmoaking, and impregnated with much tin. (See Tin.) It is made by well mixing an amalgam of four parts of tin, and five parts of mercury with an equal weight of corroſive ſublimate, by triturating the whole together in a glaſs mortar, or it may be prepared by melting, in an iron ladle, 5 oz. of pure tin, adding to it five drachms of mercury, ſtirring them together, and pouring out the amalgam into a marble mortar; and then putting 20 oz. of corroſive mercurial muriat in fine powder, and mixing the whole thoroughly. This mixture is to be put into a glaſs retort, which is to be placed in a reverberatory furnace. To the retort is to be luted, with fat lute, a receiver, with a ſmall hole in it, in the ſame manner as is done for the diſtillation of concentrated mineral acids; the diſtillation is begun with a graduated and well managed fire; with an Argand lamp, or a ſand-bath. A very ſmoaking liquor paſſes into the receiver, and towards the end of the diſtillation a very thick and even concrete matter. When the operation is finiſhed, the liquor in the receiver is to be poured quickly into a cryſtal glaſs bottle, with a glaſs ſtopper. When this bottle is opened, a white, copious, thick, and poignant fume iſſues, which remains long in the air without diſappearing. (Macquer's Chem. Dict.) Prouſt gives, as the beſt proportions, 8 oz. of powder of tin (probably ſuch as is made by melting the metal and ſhaking it in a box), and 24 oz. of corroſive ſublimate, which afford 9 oz. of the ſmoaking liquor. See Ether.

Liquors, *Stygian*. See Stygian *Liquors*.

Liquors, *Clearing of*. See Clarification.

LIQUORICE, in *Botany*, *Gardening*, and the *Materia Medica*. See Glycyrrhiza.

Liquorice, in *Agriculture*, a plant of the long tap-rooted kind, often cultivated for medicinal and other uſes in the field. It grows to about four or five feet in height; its ſtalks are hard and woody; its leaves ſmall and roundiſh, ſtanding together on the two ſides of a rib, and making what botaniſts call a winged leaf. There are two ſpecies of this plant in cultivation, the *ſmooth podded* and the *prickly podded*; but they differ little, except in the ſeed-pods of the latter being armed with prickles. It is remarked that both theſe ſpecies are very hardy perennials, but that the firſt is the ſort commonly cultivated for uſe, its roots being fuller of juice, and ſweeter than the other.

It is chiefly grown for the root, which is perennial; but the ſtalks riſe in ſpring, and decay in autumn.

It is a plant which delights in a deep light ſoil, in which its roots may run down three or four feet deep, and attain a large ſize, eſpecially when permitted to ſtand three or four years. From the main root ſmaller ones generally run off horizontally; and from theſe horizontal roots, that run near the ſurface, cuttings for ſets or young plants are taken for propagation, which are generally procured at the time when the liquorice is taken up for uſe, which is in about three years after planting: but cuttings for planting may occaſionally be taken off before that period, if wanted. At the time of planting, the cuttings ſhould be divided into lengths of ſix or eight inches, each having one or more good buds or eyes, being put into the ground at any time, in open weather, from October till March; but from the middle of February till the middle of March is the beſt ſeaſon for this work: and an open ſituation is always the moſt proper for a plantation of this kind.

It has been long ſince obſerved, that this plant thrives beſt on a deep, looſe, rich mould; and if it is freſh land that has not for many years borne corn, the profit will be the greater, as the crop will be larger, and the roots of a finer quality. A rich ſandy ſoil, provided it is deep, will do well for this plant; and it muſt always be remembered, that too much moiſture is its greateſt enemy: let no one, therefore, attempt to plant it on a damp clay, leſt the whole crop be cankered.

Soils intended for liquorice ſhould be trenched two or three ſpades deep, if the depth of them will admit: then having the ſets ready, proceed to plant them by line and dibble, planting the ſets a foot diſtant in each row; putting them perpendicular into the ground, with the tops about an inch under the ſurface, and let the rows be a foot and a half aſunder; though ſome ſcarcely allow more than twelve inches between row and row. A crop of onions is alſo ſometimes ſown on the ſame ground the firſt year; which, as the roots of the onions are ſlender, and the ſtems ſpread but little at top, may be done without any detriment to the liquorice or the onions, as the former ſeldom riſes above ten or twelve inches high the firſt ſummer. The ground muſt be kept clean from weeds, during the ſummer ſeaſon, by hoeing; and if there is a crop of onions, the ſmall hoe ſhould be employed, cutting them out to four or five inches diſtance, and clearing away all ſuch as grow immediately cloſe to the liquorice plants; and when they are gathered, give the ground a thorough hoeing with a large hoe, to looſen the ſurface, and deſtroy all weeds effectually. In autumn, cut down the decayed ſtalks of the liquorice, and nothing more is neceſſary till ſpring. But in February or March, a ſlight digging ſhould be given between the rows; and, during ſpring and ſummer, all weeds be kept down by broad-hoeing; and in autumn, when the ſtalks are in a decaying ſtate, they muſt be again cut down to the ſurface of the earth, as has been juſt obſerved. The ſame management muſt be repeated every ſucceeding year; but after the firſt or ſecond year, the ſtalks of the liquorice will ſhoot ſtrongly, and ſoon cover the ground, ſo as to retard the growth of weeds in a great degree. Likewiſe every autumn, about October, when the ſtalks begin to decay, and they have been cut down to the ground, as has been adviſed before, they ſhould be wholly cleared away. It is remarked, that land cannot be made too fine, or dug too deep for liquorice; that it ſhould be at leaſt moved with the ſpade to the depth of two feet and a half; and if a little deeper, ſo much the better. And that if the land on which the liquorice ſets are to be planted is freſh, rich, and in good heart, it needs no manure for the firſt crop; but that if it has been for ſome years in tillage, the planter will do well to give it, in the ſummer time, a good dreſſing of very rotten dung, lime, and coal-aſhes, or ſoot, mixed together, ſome months before, into a compoſt: the quantity muſt be regulated by the ſtate of the land, always remembering that this plant requires a great deal of nouriſhment, and is a great impoveriſher of the ſoil, though it extracts much of its nouriſhment or food from a conſiderable depth.

But in another mode, after the ground has been properly prepared, and reduced to a very fine tilth, and laid level, ſome ſets are to be procured. Theſe are directed to be planted in rows, with dibbles armed with iron points. Some prefer rows at two feet aſunder, putting the ſets fifteen inches from each other, and three rows are planted on a ſix-feet bed; they are allowed two feet more of interval betwixt bed and bed. And in putting in ſets with a dibble, the upper end of each ſet is left juſt level with the ſurface of the ground: and when the whole ſpot of ground is planted, labourers dig up the intervals one ſpit deep, and ſpread the earth on the beds; which raiſes them about two inches above the heads of the ſets, which, by lowering the intervals, ſerves in wet ſeaſons to drain the beds. It is generally contrived to get this work done by the laſt week in September; but in favourable years, the middle of October is not too late. If the weather proves mild, no further trouble is taken with them during the winter; but if it is likely to freeze hard, the beds are covered with peas-haulm, or long dung, or ſome ſuch matters, to forward the growth of the roots in the ſpring, and protect them during the winter from the froſts. Early in the ſpring, on the firſt appearance of the weeds, the liquorice is allowed a thorough hoeing; and this is ſeveral times repeated in the dry weather of the ſummer. The winter following, they are again covered with long dung; and in the ſpring, before the roots begin to ſhoot, the ſpaces betwixt the rows on the beds are looſened with a ſpade, and the intervals dug: immediately after which, the land has a ſlight dreſſing of coal-ſoot given, which is ſown by hand: this ſhould be thick enough to make the land look black, which, by the firſt rains waſhing it in, greatly puſhes and invigorates the plants. The ſecond and third ſummers, it is only neceſſary to keep the crop clear of weeds.

About the third year after planting, the roots of the liquorice will be in a ſtate to take up; and the proper ſeaſon for this is any time from the beginning of November till February, as they ſhould neither be taken up before the ſtalks are fully decayed, nor deferred till late in the ſpring; otherwiſe the roots will be apt to ſhrink and diminiſh in weight.

Manner of taking up.—The mode of taking up the liquorice roots is by trenching the ground, beginning at one end, and opening a trench cloſe to the firſt row three ſpades deep, or to the depth of the roots; at which work, three or four ſpadeſmen are generally employed at each trench: one goes on with the top ſpit, a ſecond with the next ſpit, another with a third ſpit, and the fourth ſpadeſman commonly gets to the bottom of the roots, having a mattock to aſſiſt him occaſionally in clearing them; and, as he takes them up, throws them on the top of the ground. In this way they proceed from row to row, till the whole plantation is taken up. The ſmall ſide-roots are then trimmed off, and the beſt of them divided into lengths proper for freſh ſets, and the main roots tied in bundles for the purpoſe of ſale. It is of much conſequence to ſell them as ſoon as poſſible after they are taken up, as they are apt to loſe much of their weight by keeping.

After a crop of this root has been taken up, if it was planted on freſh land, the ſame ground is generally prepared to yield another crop; and this takes up nearly a year. In doing which, it has given it, during the winter, a thorough good dreſſing of well-rotted dung, mixed with lime: of this large quantities are laid on, ſtill having regard to the condition of the ſoil, and ploughing it well in the enſuing ſummer. In ſuch looſe ſoils as are proper for this plant, there is no occaſion to dig the land for this crop a ſecond time, the taking up the roots having ſtirred it to a ſufficient depth: this, with three or four ſummer ploughings, is as much as is neceſſary. In other reſpects, it is managed the ſame as for the preceding crop.

But if the land which has borne a crop of liquorice root was not freſh when it was planted, but had been ſome time in tillage, it is ſcarcely ever choſen to plant again with the ſame crop, without allowing ſeveral years to elapſe.

After-Culture.—In whatever way this crop is cultivated, it ſhould be kept perfectly clean by effectual hoeing in May and June; and for this reaſon it is better not to ſow onions, or any other ſmall plants, upon the land with this ſort of plants. In the liquorice huſbandry, the land ſhould likewiſe be very highly manured, and be kept well water-furrowed for the ſpring months.

In order to diſcover how much liquorice-root is waſted by being kept in dry places, a choice was made of a piece of ſingle root thirteen inches long, and full three-fourths of an inch diameter throughout, which weighed five ounces; and nine ſmall roots, thirteen inches long each, and from one-fourth to one-eighth of an inch in diameter, which weighed alſo five ounces. All theſe were put into a drawer in a dry room, the beginning of February, and were weighed the beginning of Auguſt following; when the largeſt ſingle root weighed two ounces and three quarters, and the nine ſmall roots alſo weighed full two ounces and three quarters: ſo that in ſix months theſe roots loſt almoſt half their weight. They were green and juicy when put into the drawer, and were now pretty dry and hard; but not quite ſo dry and hard as ſome of the ſame liquorice that had lain all that time in the open room. But liquorice may be kept in moiſt ſand, or laid in the earth as long, with very little waſte or loſs of weight.

As liquorice is an upright growing plant, and not apt to lodge, and its roots deſcending deep, it is very proper for the horſe-hoeing culture; in which it will probably arrive to greater perfection than in the uſual method of cultivating it, as deſcribed above.

However in Yorkſhire, where liquorice is cultivated in rich ſandy ſoils, its roots ſometimes penetrate to the depth of three or four feet, ſometimes more; but the digging of the ground all over to that depth, when it is taken up, is very expenſive. As a ſaving in this reſpect, the planters, in digging up the ground, lay it in a proper form, and replant it, making one digging ſerve for both purpoſes, which is a good method; but they ſet the plants much too cloſe: whereas, if they planted them in rows, at about four feet diſtance, and horſe-hoed it, the weeds might be deſtroyed, and the land greatly improved, eſpecially if trench-hoed; and the produce would probably be very great, after ſo full a preparation of the land. And in addition to this, it may be obſerved, that this method of cultivation is much cheaper than by hand-work, which is the uſual method.

LIQUORICE *Vetch.* See ASTRAGALUS.

LIQUORICE *Vetch, Knobbed-rooted.* See GLYCINE.

LIQUORICE, *Wild.* See ABRUS.

LIRA, or LIRE, a money of account in Italy, and alſo a ſilver coin, particularly at Milan and Venice.

LIRELLA, the diminutive of *lira*, a ridge or furrow, is uſed by Acharius for the peculiar fructification, or receptacle, of the genus *Opegrapha*. (See LICHENES.) Its colour is generally very black, though ſometimes hoary with a ſort of efflorеſcence; its form oblong, ſeſſile or immerſed, ſimple, aggregate or branched. The diſk is uſually narrow and linear, occaſionally ſomewhat dilated; the margins parallel, various in thickneſs and elevation. In Engliſh this receptacle is termed a *cleft*.

LIRIA, or LLIRIA, in *Ancient Geography*, a town of Spain, in the province of Valencia; 18 miles S. of Segorbe. This is a very ancient town, which is ſaid to have exiſted before the arrival of the Phœnicians in Spain. Under the Carthaginians it bore the name of Edera, and under the Romans of Edeta and of Laurona, when it was the capital of the country of the Edetani. There are ſome Roman monuments remaining. The town was almoſt deſtroyed during the wars of Sertorius and Pompey; but being afterwards rebuilt, it was taken by the Goths from the Romans, from the Goths by the Moors, and from them, in 1252, by

James the Conqueror, king of Aragon, who ſomewhat changed its poſition.

It is ſituated between two little hills: it has a pariſh church, two chapels of eaſe, two convents of Trinitarian and Franciſcan monks, and a population of about ſix or ſeven thouſand perſons. This town has the title of duchy. King Philip V. gave it to marſhal Berwick, and his deſcendants ſtill poſſeſs it.

LIRIODENDRUM, in *Botany*, from λιριον, or λειριον, *a lily*, and δενδρον, *a tree;* the Tulip-tree. Linn. Gen. 278. Schreb. 373. Willd. Sp. Pl. v. 2. 1254. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 329. Juſſ. 281. Lamarck Illuſtr. 491. Michaux Boreal-Amer. v. 1. 326. Gærtn. t. 178.—Claſs and order, *Polyandria Polygynia*. Nat. Ord. *Coadunatæ*, Linn. *Magnoliæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of three oblong, obtuſe, concave, ſpreading, equal, petal-like, deciduous leaves. *Cor.* bell-ſhaped, regular, of ſix oblong, obtuſe, equal petals, concave at the baſe. *Stam.* Filaments numerous, inſerted into a conical receptacle, ſhorter than the corolla, linear; anthers terminal, longer than the filaments, but ſtill ſhorter than the corolla, linear, erect, of two cells, burſting longitudinally at the outer ſide. *Piſt.* Germens numerous, diſpoſed in the form of a cone; ſtyles none; ſtigmas all crowded together, obtuſe. *Peric.* Caſes numerous, imbricated in the form of a cone, lanceolate, compreſſed, leaf-like, triangular and tumid at the baſe, each of one cell, not burſting. *Seeds* two, ovate.

Eſſ. Ch. Calyx of three leaves. Petals ſix. Anthers burſting outwardly. Seed-caſes lanceolate, imbricated in the form of a cone.

1. L. *tulipifera*. American Tulip-tree. Linn. Sp. Pl. 755. Curt. Mag. t. 275. Sm. Inſ. of Georgia, t. 102. (L. foliis angulatis truncatis; Trew Ehret, t. 10.)—Leaves lobed, abrupt.—Native of hills in moſt parts of North America, where it is vulgarly called the Poplar. This fine tree was cultivated by biſhop Compton, at Fulham, in 1688, and is now not unfrequent in England, though ſeldom flowering till an advanced age. We have however known it bloom when about 16 years old. The firſt which produced bloſſoms in this country, is ſaid to have been at the earl of Peterborough's, at Parſon's green, near Fulham. There were ſeveral, early celebrated for their ſize aud beauty, at Waltham Abbey, one of which remained lately, and perhaps ſtill flouriſhes.

Botaniſts indicate two varieties in North America, one of which is figured in Plukenet's *Phytographia*, t. 68. f. 3, and appears to differ from the common kind, repreſented in the plates we have quoted above, in having four ſlight lobes, inſtead of two great ones, at each ſide of the leaf. We have indeed obſerved the leaves to have occaſionally divided ſide-lobes, in our gardens; but as there are ſaid to be differences alſo in the colour and quality of the wood, it is much to be ſuſpected that theſe make in fact two ſpecies. In ſome trees the wood is ſaid to be yellow, ſoft and brittle; in others white, heavy, tough and hard; but no one has obſerved whether each particular variety has either form of leaf appropriated to it, which would ſettle the queſtion. The remarkable ſhape of the *leaves* of the Tulip-tree, cannot fail to ſtrike the moſt careleſs obſerver. They ſeem as if cut off with ſciſſars at the end. The elliptical obtuſe deciduous *ſtipulas*, which curiouſly enfold the young leaves, are alſo remarkable. The *flowers*, though not glaring nor ſcented, are ſingularly beautiful, reſembling a ſmall tulip, variegated with green, yellow, and orange. They appear in June and July, ſtanding ſolitary at the ends of the branches. The young bark of this tree is very aromatic.

2. L. *liliifera*. Indian Tulip-tree. Linn. Sp. Pl. 755. (Sampacca montana; Rumph. Amboin. v. 2. 204. t. 69.)—Leaves lanceolate.—Native of lofty mountains in Amboyna. Linnæus adopted this ſpecies entirely from Rumphius, led, as it ſeems, by his delineation of the fruit, which indeed ſomewhat reſembles that of a *Liriodendrum*. There is much in his deſcription, as well as figure, that accords with *Magnolia pumila*, Andr. Repoſ. t. 226. Curt. Mag. t. 977, a plant cultivated in various parts of the Eaſt Indies, as well as in China, but whoſe native country, like the ſtructure of its fruit, is really unknown. M. Correa de Serra, whoſe botanical acuteneſs is ſo well known, has pointed out to us what he conceives to be a certain criterion to diſtinguiſh a *Liriodendron* from a *Magnolia*, the cells of the anthers opening at the inner ſide in the latter, at the outer ſide in the former, which difference is confirmed by the total difference in their fruit. By this rule the *pumila* is a *Magnolia;* but reſpecting the ſuppoſed *Liriodendrum liliifera*, nothing can be gueſſed, except from its habit. We ſuſpect moreover that the *pumila*, when its fruit is known, may exhibit characters in that part, ſufficient to ſeparate it from both theſe genera; as may alſo be the caſe with *M. fuſcata*, Ait. Hort. Kew. v. 3. 331. Andr. Repoſ. t. 229. Curt. Mag. t. 1008, whoſe anthers likewiſe burſt inwardly.

What the *L. liliifera* of Loureiro, Cochinch. 346, may be, is very doubtful. He deſcribes the anthers as opening by a terminal pore.—Here then may be another diſtinct genus. The flowers are ſaid to be large, pale and ſcentleſs. Seeds imbricated in the form of a cone. He deſcribes two more, which Willdenow has adopted from the German edition of his book, as we gueſs from the miſquotation of pages. Theſe are named 1, *L. Figo*, which has a ſingled-leaved ſpathaceous calyx, and a pale flower, dotted with red; and 2, *L. Coco*, which has a three-leaved calyx, and large, very white, ſweet flower. Both are cultivated at Macao and Canton. The deſcription of their fruits is like that of the genus before us, but we much doubt their belonging really to it. Nothing, in ſhort, requires more inveſtigation than the genera of this tribe, becauſe ſcientific botaniſts had very little opportunity of ſeeing their whole fructification. We would recommend the conſideration of their anthers and ſeed-veſſels. The calyx is perhaps of leſs importance, except for ſpecific diſtinctions.

LIRIODENDRUM, in *Gardening*, compriſes a plant of the hardy deciduous ornamental kind, of which the ſpecies cultivated is the common tulip-tree, L. tulipifera.

Method of Culture.—Plants of this kind may be raiſed by ſowing the ſeeds, imported annually from America by the ſeed-dealers, in ſpring, either in the full ground, in beds of rich light earth, in a warm ſituation, placing the ſeed lengthwiſe, and covering it nearly an inch deep; or in pots or boxes, plunging them in a gentle hot-bed. When the young plants appear they ſhould be well ſcreened from the ſun, and have free air. They uſually come up the ſame ſeaſon; when in the former method water ſhould be given them in dry weather; and if the bed be arched over with hoops, to have occaſional ſhade from the mid-day ſun in ſcorching weather, it will be beneficial to the germination of the ſeeds and growth of the young plants; continuing the waterings with care occaſionally during the ſummer; and in winter, ſheltering them with mats in froſty weather to preſerve their tops, which are ſometimes a little tender the firſt year, and apt to ſuffer in this way.

When the plants are two years old, they ſhould be ſet out in ſpring in nurſery rows, two feet diſtant, and a foot aſunder in the rows; to remain a few years, till from three to ſix or eight feet high, when they may be planted where they are to remain.

But they are raiſed beſt in the open ground, where the beds are prepared of good mellow rich earth, blended with old rotten cow-dung, ſifting over the ſeeds fine turf-mould, mixed with fine ſea or pit-ſand. And they ſucceed beſt afterwards in a light ſoil, not too dry. They ſhould have their roots and branches as little pruned as poſſible.

This is a plant that grows ſo large as to become a tree o the firſt magnitude in its native ſituation, and it is generally known by the title of poplar: of late there have been great numbers raiſed from ſeeds in this country, ſo that they are become common in the nurſeries, and there are many of the trees in different parts which annually produce flowers.

At Allerton-hall, the ſeat of William Roſcoe, eſq. there is a very large tree of this kind which flowers well.

Theſe trees are highly ornamental in large plantations, among others of ſimilar growth, and have a fine effect when planted out ſingly in large openings, kept in ſhort graſs, in pleaſure grounds, or other ſituations, when they flower in any full manner.

LIRIOPE, in *Botany*, a genus dedicated by Loureiro to the mother of Narciſſus; a plant of the ſame natural family having been deſtined to commemorate her ſon. The blue colour of the preſent flower is thought alſo, by this author, to accord with the epithet *Cærula Liriope;* ſee Ovid's Metamorphoſis, lib. 3. 342.—Loureir. Cochinch. v. 1. 200.—Claſs and order, *Hexandria Monogynia*. Nat. Ord. *Spathaceæ*, Linn.

Gen. Ch. *Cal.* Sheath ovate, incurved, ſingle-flowered, ſmall, permanent, of one leaf. *Cor.* inferior, bell-ſhaped, ſpreading, divided into ſix deep, oblong, reflexed, fleſhy, equal ſegments. *Stam.* Filaments ſix, awl-ſhaped, erect, equal, ſhorter than the corolla, inſerted into the receptacle; anthers oblong, erect. *Piſt.* Germen ſuperior, roundiſh; ſtyle thick, furrowed, reflexed, as long as the ſtamens; ſtigma ſimple. *Peric.* Berry ovate, ſmooth, fleſhy, ſingle-ſeeded. *Seed* ovate.

Eſſ. Ch. Corolla in ſix deep ſegments, inferior. Sheath ovate. Berry ſingle-ſeeded.

1. L. *ſpicata.* Loureir. *Taóc tien* of the Cochinchineſe, *Mac lán* of the Chineſe.—Found commonly both in rude and cultivated ground of thoſe countries. *Roots* perennial, oblong, ſolid, brown *bulbs*, connected by creeping radicles. *Stem* none. *Leaves* numerous, crowded together, ſword-ſhaped, ſtiff, ſmooth, nearly erect, a foot long. *Flower-ſtalk* naked, round, ſlender, ſtraight, about as long as the leaves. *Flowers* ſpiked, rather ſmall, of a pale blue colour, without ſmell.

The herb before us is ſaid to have a cooling quality, and a decoction of its leaves is thought to ſtrengthen the hair. We know not what to make of Loureiro's deſcription as to referring it to any known plant.

LIRIS, in *Ancient Geography*, a river of Italy, which anciently bounded the territory of Latium towards the ſouth. This river, called alſo *Clanis* and *Glanis*, and now *Garigliano*, deſcends from the country of the Marſi towards the Apennines, or by the lake Fecinus, receives many ſtreams in its ſlow progreſs ſouthward, and at length loſes itſelf in the bay of Cajeta or Gæta. Towards its mouth, and at ſome diſtance from a grove conſecrated to the nymph Marica, the river formed extenſive marſhes. Pliny obſerves that the waters were there hot, whence Silius Italicus gives to the Liris the epithet ſulphureous. It is related, that in the year of Rome 666, Marius, purſued by the faction of Sylla, concealed himſelf in theſe marſhes, with his body under water and his head covered by roſes. The ſame place ſerved alſo as an aſylum to Varus, one of the perſons proſcribed by the triumvirate of Octavius, Antony, and Lepidus.

LIRIUM, in *Botany*, λείριον of the Greeks, is ſynonimous with *Lilium*, but Van Royen, in his *Floræ Leydenſis Prodromus*, retains it as the name of that genus, becauſe he uſes *Lilia* for the appellation of the natural order; and for this meaſure he is ſomewhere commended by Linnæus, under whoſe inſpection the book was written. *Lirium* is however become entirely obſolete.

LIS, in *Geography*, a lake of Ruſſia, in the government of Tobolſk, in the midſt of an extenſive moraſs. N. lat. 63° 5′. E. long. 99° 14′.—Alſo, a river of the ſame name, which runs into the Eniſei. N. lat. 62° 20′. E. long. 90° 14′.

Lis, *Fleur de.* See Flower-*de-Luce.* This flower was not only borne in the ancient arms of France, but adopted by our kings till the late union with Ireland. The electoral cap, as emblematic of Hanover, and the ſhamrock for Ireland, have been ſubſtituted for it.

Lis, or *Li*, an itinerary meaſure of China, equal to $1897\frac{1}{2}$ Engliſh feet: ſo that $192\frac{1}{2}$ lis meaſure a mean degree of the meridian nearly; but European miſſionaries in China have divided the degree into 200 lis, each li making 1826 Engliſh feet.

LISARA, in *Geography*, a town of European Turkey, in the province of Albania; 52 miles S.S.E. of Albaſano.

LISBON, Olisipona or *Oliſibona*, the metropolis of Portugal and royal reſidence, ſituated in the province of Eſtramadura, and forming a kind of creſcent or amphitheatre, on the right bank of the Tajo or Tagus, on ſeveral hills. The Portugueſe compute the length of the city at two leagues; and the diſtance from Belem to the eaſtern extremity is ſtated by Link to be a full German mile, or about $4\frac{1}{2}$ Engliſh miles. The breadth of the town is very various, often but ſmall, and ſometimes quite inconſiderable, not exceeding one ſtreet, but never much more than half a league. It formerly contained ſeveral magnificent churches, 50 colleges and convents, two elegant palaces, a caſtle commanding the town, and ſeveral handſome ſquares. It was ſurrounded by a ſingle wall, on which were 77 antique towers of no great ſtrength. On the river ſide it had 26 gates, and on the land ſide 17. The ſtreets were narrow and dirty, and ſome of them very ſteep. The houſes of the citizens were generally very mean, but thoſe of the nobility and gentry were built with ſtone, and exhibited an elegant appearance. Such was the ſtate of this city before it was almoſt totally deſtroyed by the earthquake, which happened Nov. 1, A. D. 1755. Since this cataſtrophe it has been built on a regular plan. The population is not eaſily aſcertained. According to the decennial cenſus in the year 1790, the 40 pariſhes of Liſbon contained 38,102 fire-places or hearths; theſe include the ſuburbs of Junqueira and Alcantara, but not the villages of Belem and Campo-Grande, though theſe, particularly the firſt, are connected with the town, being within the boundary of Liſbon. Including Belem, a market town which completely joins Junqueira, the population may be eſtimated, according to Link, at above 300,000, excluſive of the military. Liſbon is quite open on all ſides, having neither walls nor gates, nor even any fortifications, except a ſmall caſtle in the middle of the town, and a number of batteries or ſmall forts on the river. The ground on which the city ſtands is very hilly, and, according to the Portugueſe writers, is ſituated,

ated, like ancient Rome, on ſeven hills, but it may be more properly regarded as ſtanding on three hills. The firſt begins at the bridge of Alcantara, forming the proper weſtern limit of the town, and extending to St. Benedict's ſtreet. This hill is the higheſt, and much celebrated for the ſalubrity of its air. At the weſtern extremity it is but little cultivated, but farther to the eaſtward up to its ſummit, forming in that direction a plain, on which ſtands the new monaſtery. In many parts it is ſo ſteep, that it is laborious to walk along the ſtreets, and even the lower ſtreet, which runs along the river, has conſiderable declivities, and is much incommoded by torrents occaſioned by heavy falls of rain. In this part many handſome houſes are erected, intermixed with thoſe of a meaner ſort, in ſtreets that are irregular, ill paved, and often narrow. Among theſe ſcattered houſes are gardens and even corn-fields. On this hill the late queen built a church and convent, to which ſhe was much attached. The church is handſome, but conſtructed in a bad taſte, and overloaded with ornaments. Not far from this church is the Proteſtant burial ground, which is planted with cypreſſes and Judas trees (cercis ſiliquaſtrum). Beyond the houſes is a pleaſant plain, called Campo de Ourique, ſeparated from the neighbouring hills by deep vallies, and uſed as a promenade by the lower and middling claſſes. The ſecond hill is a continuation of the firſt, from which it is ſeparated by a valley of no great depth; it extends from St. Benedict-ſtreet to the valley in which are three new ſtreets built by Pombal. At the foot of the eaſtern ſide of this hill the earthquake did great damage, of which traces remain, and thus made way for the erection of ſeveral handſome houſes. On this eaſtern declivity is the opera-houſe. Above the public promenade this hill riſes to a conſiderable height, and is very ſteep towards the next valley. This eminence affords a very fine view; in the valley beneath appears the beſt part of the town; to the left are olive-gardens interſperſed with many houſes, monaſteries, and churches; oppoſite is the high ſteep hill on which the caſtle ſtands; to the left the Tagus covered with ſhips. This hill is ſucceeded by an even valley of conſiderable length and breadth, which forms the broadeſt part of the town, which was entirely rebuilt after the earthquake of 1755. On the bank of the river is a handſome ſquare, formerly the terrace or parade of the royal palace, 610 feet by 550. The quay, and the groups of people where the ſhips and boats are landing and taking in their cargoes, excite attention. The eaſt ſide is formed by a large building with an arcade, terminating in a pavilion, which is uſed as an exchange. Oppoſite to it is a ſimilar building without a pavilion. In the centre of this ſquare, the avenues of which are unfiniſhed, is an equeſtrian ſtatue of Don Joſeph in bronze, on a pedeſtal of ſtone adorned with various ſymbols. The three principal ſtreets rebuilt ſince the earthquake, are formed by large buildings of conſiderable elevation and good appearance. The line that divides Eaſt and Weſt Liſbon, which is an eccleſiaſtical diſtinction (the former belonging to the biſhop of Liſbon and the latter to the patriarchate) paſſes through this part of the town. Near this ſpot is the great palace of the Inquiſition. Another ſmall ſquare not far diſtant is uſed as a promenade, and forms a garden, with ſeveral avenues of various kinds of trees and hedges. Behind this garden are the play-houſe and the ſquare uſed for bull-fights: and at a ſmall diſtance are market places. The third hill begins with an eminence, on which is the caſtle of Liſbon, from which it continues, with ſome interruption of plains, to the eaſtern extremity of the town. The caſtle is a ſmall fort. This part of the town conſiſts of narrow, irregular, ill-paved ſtreets, in which occur a few neat houſes. The buildings are conſtructed on bad models; and even among the churches there is not one particularly diſtinguiſhed, and a conſtant noiſe of little bells and bad chimes renders them ſtill more unpleaſant. The patriarchal church is famous for the royal ſepulchres which it contains. This was conſtructed in the year 1706 by pope Clement XI., who granted to it a chapter. The patriarch has been generally a cardinal, and its revenue is computed at 114,000*l.* Liſbon was erected into a biſhopric in the 5th century, and when it was retaken from the Moors by Don Alphonſo, the biſhopric was re-eſtabliſhed by pope Eugenius III.; and in the year 1390 it was erected into an archbiſhopric. The cathedral is a Gothic edifice, dedicated to St. Vincent, who is ſaid to have ſuffered martyrdom on the cape which bears the name, and it is richly ornamented. The royal palace, which fronts the Tagus, is a large and magnificent edifice, and contains a library collected at a vaſt expence by John V. There are ſome other public buildings, which are conſtructed in a magnificent ſtyle. Along the river to the E. of Liſbon there is a ſucceſſion of ſmall houſes and villages. To the W. Belem ſo nearly joins Liſbon, that their reſpective boundaries are not eaſily diſtinguiſhed: and the ſuburb of Alcantara is only ſeparated by a bridge over a ſmall brook which here falls into the Tagus. This ſuburb is only ſeparated by an artificial boundary from that of Junqueira, as the latter is from Belem, which is a conſiderable market-town, where many perſons of property and tradeſpeople of the higher claſſes have houſes. Formerly the royal family reſided here, but the caſtle being burnt they removed to Quelus. (See BELEM.) Beſides the church of the monaſtery of Hieronymites, which is in a Gothic but grand ſtyle, there are in Belem two new built and very handſome churches. Near to one of theſe are the botanic garden and muſeum, and a royal garden with a menagerie and ſeveral aviaries. Beyond Belem is a park of conſiderable ſize belonging to the prince, in which are olive-trees and broom; and the chace on the N. of the river is appropriated to the prince, but that on the S. is for the uſe of the public. To the N.W. appear the mountains of Cintra, which lie N.E. and S.W. The Tagus waſhes the foundations of the houſes throughout Liſbon; being towards the eaſtern part about two or three leagues broad; to the W. it becomes narrower, and as far as its mouth it is only about a league broad. The river is often covered with ſhips, and large men of war may lie oppoſite to the town. The ſcene is intereſting; and the market-town called Almada, with its church on the ſummit of the hill, and the Engliſh hoſpital at the foot of it, enlivens the picture. The ſide of Liſbon towards the country conſiſts entirely of hills, from which are ſeen only the higheſt edifices of the town, and the traveller arrives ſuddenly in the city before he is aware of it. The adjacent country, particularly on the N. and E. ſides, to a conſiderable diſtance, is covered with large gardens ſurrounded with high walls. Theſe gardens are called in Portugueſe "quintas," and they generally contain plantations of orange and olive-trees, and ſometimes corn-fields and even vineyards. Beyond the weſtern part of Liſbon the country preſents naked and rocky hills; but ſome of theſe are luxuriantly fertile. The hills, indeed, form the meadows of Liſbon. The ſoil round the city conſiſts of lime-ſtone and baſalt. Cloſe to the N. ſide of the town is the famous aqueduct, conſtructed of a kind of white marble, and completed in 1738. It ſerves to convey water from ſeveral ſprings ſituated at a diſtance of three leagues, near the village of Bellas, being in ſome parts conducted under ground. Near the town it paſſes over a deep valley, and reſts on ſeveral bold arches, the largeſt of which is 230 feet 10 inches French high, and 107 feet eight inches broad. Its pointed arches ſeem changed, when viewed from beneath it, into majeſtic vaults that re-echo every ſound. The whole length of the aqueduct is 2400 feet. In the middle is a covered arch-way of ſeven or eight feet, where the water flows on each ſide through a tunnel of ſtone. Without this arched way and on each ſide is a path, where two perſons can walk abreaſt, with a parapet. The water enters the town at a place called da Amoreira, when it divides into ſeveral other aqueducts, and ſupplies the fountains, which, though formed in a bad taſte, are ornamental. Here the gallegos draw water in ſmall barrels, and cry it about the ſtreets. The water is very good, containing a portion of oxygenated calcareous earth; its ſources being in lime-ſtone hills. The trees that grow on the N. ſide of Liſbon are chiefly olive and orange trees. The latter are propagated by ſeed and afterwards grafted. In December and January the oranges begin to turn red, and at the end of January and in February, before they are ripe and ſweet, they are gathered for exportation. Toward the end of March and in April they are very good, but delicate perſons will not eat them till the beginning of May; at which time they begin to be perfectly ſweet and well-flavoured. One tree frequently bears 1500 oranges, and ſometimes 2000, and rarely 2500. The climate of Liſbon is reckoned very ſalubrious. A heat equal to 96° Fahr. is not uncommon in Portugal. The medial heat is generally about 60°. From Midſummer-day to the middle of September rain is very uncommon; in November and December heavy rains with frequent ſtorms occur. Days of perpetual ſilent rain are very rare; for in general it comes down in torrents. In January cold clear weather often prevails, but becomes milder in February, which is generally a very pleaſant month. The days of fair weather amount to 200 in the year, and thoſe of ſettled rain ſeldom exceed 80. In this city grates for fire are almoſt unknown. Ventilation and coolneſs are chiefly conſulted; and in winter a warm cloak ſupplies the want of a fire. In the vicinity of Liſbon the harveſt is in May, and the corn is thraſhed as it is with us; but in ſome parts it is trodden out by horſes or oxen, for which purpoſe a floor is made in the fields. The Portugueſe live chiefly on meat and fiſh, but are not fond of vegetables. In Liſbon the bread is generally bad. It is uſually made of wheat flour, ſometimes of maize, and never of rye. Potatoes are not cultivated, but imported from England and Ireland. Both the rich and poor conſume great quantities of bacalhao, of which the Engliſh export thither to the value of a million and a quarter of dollars. The Sardinha, or pilchard, is alſo the food and comfort of the poor. The fruits moſt common are oranges and grapes. In the vicinity of Liſbon is a ſmall vineyard, that of Carcavella, or Carcavelos, yielding a peculiar grape, which gives name to the Liſbon wine or to Carcavella; a wine that is ſaid to be generally fabricated in London. The badneſs of the police ſtrikes every foreigner on entering Liſbon. The filth is ſuffered to lie in heaps in the ſtreets, unleſs it ſhould be waſhed away by the rains. The ſtreets are rendered ſtill more inconvenient by want of light; a hoſt of dogs, without maſters, and preying on the public, wander about like hungry wolves; and, ſtill worſe than theſe, an army of banditti. The ſociety of Liſbon is dull and melancholy, eſpecially when compared with that of large Spaniſh cities. The inhabitants neither walk nor ride for mere amuſement; there is little luxury, nor are there any fine equipages. Many ſervants are kept by the higher families, but they are poorly clad and ill fed. One of the principal amuſements of the rich is the Italian opera, which is ſupported by private individuals. The play-houſe is little viſited by perſons of condition; here no women perform; and the players are frequently artiſans. The place uſed for bull-fights is a large quadrangular edifice, ſurrounded with wooden baluſtrades and benches. In ſummer there are bull-fights almoſt every Sunday, and from twelve to fifteen beaſts are killed in an afternoon: in winter this amuſement entirely ceaſes. As to the religion of the city, Link ſays, that people go to maſs becauſe they have no other walk, and that they love the ceremonies of religion as a paſtime, and follow proceſſions as they would go to an opera. Liſbon is by no means deſtitute of literary inſtitutions. The firſt and moſt important is the Academy of Sciences. (See ACADEMY.) The Geographical Academy, principally pertaining to the geography of Portugal, was inſtituted in January, 1799. Liſbon has alſo public libraries; and it has alſo ſome muſeums, and public hoſpitals.

The harbour of Liſbon is ſpacious and deep, and by the Phœnicians, who firſt traded hither, was denominated "Oliſippo," *i. e.* the Agreeable bay, whence, as ſome have ſaid, was formed the appellation of Liſbon. Others have fabulouſly aſcribed the foundation of this city to Ulyſſes, and hence derived its ancient name Ulyſſippo. The entrance of this port is difficult and dangerous, and requires the aſſiſtance of a pilot. The trade of Liſbon is extenſive; and many foreign merchants, Catholic and Proteſtant, reſide here, as it is the grand mart of all commodities brought from Brazil and other colonies belonging to the Portugueſe. N. lat. 38° 42′ 58″. W. long. 9° 4′ 40″.

Operas at the court of Liſbon, before the earthquake in 1755, uſed to be the moſt ſplendid and beſt performed in Europe. See PEREZ, GIZZIELLO, and GUADAGNI.

Liſbon and the whole of Portugal keep accounts in rees, or reas, 1000 of which make a milree. The cruſado of exchange, or old cruſado, is 400 rees, and the new cruſado 480 rees; the teſtoon 100; the vintin, or vintim, 20 rees. Hence it appears that the milree is = $2\frac{1}{2}$ old cruſados = $2\frac{1}{12}$ new ditto = 10 teſtoons = 50 vintins.

The coins of Portugal are gold pieces, coined before 1722, which are now 20 *per cent.* higher than their original value; ſo that the old dobras, coined at 20,000 rees, are worth 24,000; the Liſbonnines, or moidores, coined at 4000 rees, are worth 4800, and the halves and quarters are in proportion; but there are few of theſe coins in circulation. The gold coins, ſtruck ſince 1722, are the dobra = 12,800 rees, the meia dobra or Joaneſe = 6400 rees, the half Joaneſe = 3200 rees, the dezeſeis teſtoon = 1600, the quartinho = 1200, the oito teſtoon = 800, the old cruſado = 400 (now ſcarce), and the new cruſado = 480 rees. The ſilver coins are the new cruſado = 480 rees, halves, quarters, and eighths, or pieces of 240, 120, and 60 rees, the teſtoons of 100, and halves of 50, and vintins of 20 rees. The copper pieces are of 10, 5, 3, and $1\frac{1}{2}$ rees.

The gold piece of 6400 rees is worth 35*s.* 11*d.* ſterling. The old cruſado is worth 2*s.* 3*d*, and the milree, value in gold, is worth $67\frac{1}{4}$*d.* ſterling. The new ſilver cruſado is worth about 2*s.* 9*d.* ſterling, and the milree, valued in ſilver, is worth $68\frac{3}{4}$*d.* ſterling. Gold is to ſilver as 16 to 1.

The commercial weights are the quintal = 4 arrobas, the arroba = 32lb., the pound or arrate = 2 marks, or 16 ounces, the ounce = 8 outavas; $13\frac{1}{2}$ quintals = a ton. The pound of Liſbon is = 9552 Dutch aſes, or $7084\frac{3}{4}$ grains Engliſh troy weight; ſo that 83lb. of Liſbon = 84lb. avoirdupoiſe weight.

The meaſure for corn, ſalt, and other dry commodities, called moyo, is = 15 fanegas; the fanega = 4 alquieres = 8 meyos = 16 quartos = 32 outavas = 64 mequias. The alquiere meaſures 675 French or 817 Engliſh cubic inches; ſo that 21 alquieres are nearly = 1 Engliſh quarter, or 50 alquieres = 19 Engliſh buſhels. For liquid meaſure, the tonelada of Liſbon is = 2 pipas, the pipa = 26 almudes = 312 canadas = 1248 quartillos. The baril is = 18 almudes. The ſtandard gauge, at the cuſtom-houſe of London, of a pipe of Liſbon is 140 gallons = 31 almudes, and the almude is $4\frac{1}{2}$ Engliſh gallons nearly. The long meaſures of Liſbon are the vara = 5 palmos, and the covado = 3; the palmo = 8 inches of Liſbon, or $8\frac{1}{2}$ Engliſh inches; the covado is = $26\frac{1}{3}$ Engliſh inches; the Liſbon foot is = half a covado, or $13\frac{1}{2}$ Engliſh inches; and 9 feet of Liſbon = 10 Engliſh feet. In the freight of ſhips, 4 cheſts of ſugar, 4 pipes of oil, 4000lb. of tobacco, and 3000lb. of ſumac, are reckoned for 1 laſt. Kelly's Un. Cambiſt. See EXCHANGE.

LISBON, a town of America, in New London county, Connecticut, lately a part of Norwich; containing two pariſh churches, and 1168 inhabitants.

LISBURN, a poſt and borough town of Ireland, in the county of Antrim, and province of Ulſter, now the ſecond in the county for ſize and population; but in the reign of Elizabeth only a ſmall village, called Liſnegarvey. It lies about ſeven miles S. of Belfaſt, on the river Lagan, which ſeparates it from the county of Down. In the reign of James I. ſir Fulk Conway obtained a grant of it, and ſettled ſome Engliſh and Welſh families there. In 1641 a victory was obtained by ſir George Rawdon over the rebels under ſir Phelim O'Neil and others, little more than a month after the breaking out of the rebellion. In 1662 the church of Liſburn was erected into a cathedral for the united dioceſes of Down and Connor, and the inhabitants had the privilege granted of ſending two burgeſſes to parliament, although not a corporate body. Theſe privileges were given on account of their loyalty to Charles I. and II. In 1699 a patent was granted to ſome French refugees for eſtabliſhing a manufacture of linen in the town, to which circumſtance it chiefly owes its proſperity. The virtuous conduct and civilized manners of theſe good people were of great advantage to it, and their ſkill and induſtry ſet an example to thoſe who were concerned in the ſame buſineſs as they were, which ſoon had the effect of raiſing the quality of their manufacture to a degree of excellence unknown till then; and the linens and cambricks made in the neighbourhood and ſold in Liſburn market, have until this day kept up their ſuperior character. Though the vicinity of Liſburn to Belfaſt prevents it from being a place of much trade, there is a great deal of buſineſs done in it, in various ways. On market-days it is much frequented from the quantity of linen and other things brought to it, and it is well known as the firſt place to meet with oats of the beſt quality for ſeed. A few years ago a fine ſpire of cut ſtone was built to the church; and lately a ſteeple and cupola on the market-houſe. The houſes of worſhip are, a ſpacious church, a Preſbyterian meeting-houſe, a Quaker's meeting-houſe, a handſome Catholic chapel, and a Methodiſt chapel. There are alſo ſome good charitable inſtitutions. The number of houſes is 800, which at $6\frac{1}{2}$ gives a population of 5212. It is ſaid by Carliſle to be noted for the neatneſs of its buildings and the urbanity of its inhabitants. It ſends one member to parliament, and is 73 miles N. by E. from Dublin. Dubourdieu's Statiſtical Account of Antrim.

LISBURN, *Cape*, a cape on the W. coaſt of North America. N. lat. 69° 6′. W. long. 165°.—Alſo, a cape on the iſland of Spiritu Santo, one of the New Hebrides. S. lat. 15° 40′ 45″. E. long. 166° 57′.

LISCA-BIANCA, one of the ſmaller Lipari iſlands, near Baſiluzzo. This iſland, as well as Bottero and Dattolo, in its vicinity, is rather a rock, abounding in cruſts of ſulphate of alumine, and for the moſt part formed of lavas whitened, and ſo decompoſed that they are eaſily reducible to powder.

LISCHITZ, a town of Bohemia, in the circle of Czaſlau; 8 miles N. of Czaſlau.

LISCIANO, a town of Naples, in the province of Otranto; 8 miles S.E. of Tarento.

LISIANTHUS, in *Botany*, from λις, *ſmooth*, and ανθος, *a flower*, in contradiſtinction, as one would ſuppoſe, to certain other flowers, nearly allied in many reſpects to this, but remarkable for ſome ſort of fringe or haírineſs, as *Menyanthes*. Yet Browne, who gave the name, does not advert to this idea; and by a ſlip of the pen he quotes Burmann as being the firſt author of it, in his *Theſaurus Zeylanicus*, 145. t. 67; whereas the plant there exhibited is called *Lyſimachia*, and is *Chironia trinervia* of Linnæus!—Browne Jam. 157. Linn. Mant. 6. Suppl. 135. Schreb. 111. Willd. Sp. Pl. v. 1. 826. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 318. Juſſ. 142. Lamarck Illuſtr. t. 107.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Rotaceæ*, Linn. *Gentianæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, divided, more or leſs deeply, into five, lanceolate or roundiſh, erect, permanent ſegments, membranous at the edge. *Cor.* of one petal, funnel-ſhaped; tube longer than the calyx, ſwelling upwards, contracted juſt above the baſe within the calyx; limb in five deep, lanceolate or roundiſh, recurved ſegments, much ſhorter than the tube. *Stam.* Filaments five, thread-ſhaped, ſmooth, inſerted into the tube, juſt above its contraction, generally ſhorter than the limb; anthers ovate, two-lobed, incumbent. *Piſt.* Germen ſuperior, ovate-oblong, pointed; ſtyle thread-ſhaped, the length of the ſtamens, permanent, finally twiſted; ſtigma compreſſed, of two parallel plates. *Peric.* Capſule ovate-oblong, pointed, of two incomplete cells and two valves, the partitions formed of the inflexed margins of the valves. *Seeds* numerous, minute.

Eſſ. Ch. Corolla funnel-ſhaped, inflated; its ſegments recurved. Stigma of two plates. Capſule oblong, imperfectly two-celled; partitions from the inflexed margins of the valves. Seeds numerous.

Fifteen ſpecies of this elegant genus, little known in England, are collected by Willdenow, of which *glaber* and *frigidus* are one and the ſame. Whether the reſt all truly conſtitute one genus, may perhaps be doubted. The carinated calyx, ſuppoſed an eſſential mark, in thoſe of Browne, is not found in thoſe of Aublet, the ſegments of whoſe calyx moreover are rounded, and their corolla ſomewhat irregular and curved. Theſe more accord with *L. glaber* of Linnæus, and very correctly with his *chelonoides* found in the ſame neighbourhood.

The following examples will enable the reader to judge of the habit and leading characters of theſe different ſets of ſpecies.

L. *longifolius*. Linn. Mant. 43. Browne Jam. 157. t. 9. f. 1.—Calyx taper-pointed, keeled. Leaves lanceolate, acute. Branches round, ſomewhat downy.—Native of the mountains of Jamaica, in a dry ſandy ſoil. It forms a humble *ſhrub*, with round, oppoſite, more or leſs downy, level-topped, leafy branches. *Leaves* oppoſite, on ſhort footſtalks connected by a very ſhort, annular, intrafoliaceous *ſtipula*; their form is variable, ovate-oblong or lanceolate, acute, entire; the ſurface ſmooth, or finely downy. *Flowers* on ſhort, terminal, downy ſtalks, ſolitary, or two or three together, about an inch and a half long, of a pale delicate yellow, very elegant. Their *calyx* and *corolla* are very ſharply pointed; the former ſtrongly keeled or winged, as in many plants of the Gentian family; the *ſtigma* ſhort and almoſt capitate, yet of two parallel lobes.

This ſpecies is ſaid to bloſſom in the ſtove at Kew in June and July. Little or no bitterneſs is perceptible in the dried ſpecimen.

L. *cordifolius*. Linn. Mant. 43. Browne t. 9. f. 2, is probably but a mere variety, having ſhorter, and perfectly heart-ſhaped *leaves*, which, in our ſpecimen from Browne, are rather more downy, as well as the branches.

L. *latifolius*. Swartz. Ind. Occ. v. 1. 348. never ſeen by us, is not by his account very clearly diſtinguiſhed from theſe; for *longifolius* certainly has, by no means, "very long flower-ſtalks, widely ſpreading at their diviſions," which he attributes to it, but rather ſtalks "ſimply three-forked, ſcarcely longer than the leaves," ſuch as he deſcribes in his *latifolius*.

L. *glaucifolius*. Jacq. Coll. v. 1. 64. Ic. Rar. t. 33.—Calyx taper-pointed, as long as the tube. Leaves elliptic-oblong, ſeſſile, glaucous, ſmooth. Stem round.—This ſeems to agree ſufficiently in genus with the above, though its calyx appears not to be keeled. The *root* is perennial. *Stems* herbaceous, annual, ſlender, nearly ſimple. *Flowers* purpliſh-blue, on very long ſimple ſtalks. It bloſſomed with Jacquin in the ſtove, from July to September, but he knew not its native country.

L. *alatus*. Aubl. Guian. v. 1. 204. t. 80.—Leaves elliptic-oblong, tapering at each end, ſmooth. Stem ſquare, winged. Segments of the calyx rounded. Corolla declining.—Gathered by Aublet in cultivated as well as waſte ground in Guiana and Cayenne. One of his ſpecimens before us has the habit of a *Chelone*. Its *calyx* is blunt and rounded. *Corolla* declining, as well as the *ſtamens* and *ſtyle*, and ſomewhat irregular. The plant is ſaid to be bitter, and its qualities deobſtruent.

L. *chelonoides*. Linn. Suppl. 134.—Leaves oblong, ſlightly confluent at the baſe, ſmooth. Stem round, without wings. Branches of the panicle racemoſe. Calyx rounded.—Sent to Linnæus from Surinam, and marked No. 141. in the *Plantæ Surinamenſes*. It is ſo like a *Chelone* or *Pentſtemon*, that Linnæus actually took it for ſuch. His ſon afterwards referred it to *Liſianthus*, miſtaking it for the above ſpecies of Aublet, from which it differs in the round *ſtem*, deſtitute of wings; more elongated and racemoſe flowering-branches; and nearly ſtraight regular *corolla*.

L. *glaber*. Linn. Suppl. 134. Sm. Ic. ex Herb. Linn. t. 29. (L. frigidus; Swartz. Ind. Occ. v. 1. 352.)—Smooth. Leaves ovate, ſtalked, acute. Flowers ſomewhat corymboſe. Stem ſquare below.—Native of South America and Jamaica. A large and handſome herbaceous plant, with yellow *flowers*, whoſe *corolla* is regular and dilated. The ſegments of the *calyx* are indeed more rounded and obtuſe in the Jamaica ſpecimens than in thoſe of Mutis, but we cannot think that difference eſſential, every other part being ſo alike in both. The lower portion of the *ſtem* is wanting in Mutis's ſpecimen, which cauſed that part to be deſcribed as round, the branches being ſo, as well as in Swartz's.

L. *exſertus*. Swartz. Ind. Occ. v. 1. 346.—Leaves ovato-lanceolate, on longiſh ſtalks. Calyx taper-pointed. Stamens and ſtyle much longer than the corolla.—Native of the cloud-capped ſummits of the Blue Mountains of Jamaica. *Swartz*. It is ſaid to have been alive at Kew, but not to have flowered. The *ſtem* is ſhrubby. *Leaves* numerous, elliptic-lanceolate, tapering at each end, ſmooth, on ſlender footſtalks from half an inch to an inch long. *Flowers* rather ſmall, in three-forked compound panicles; remarkable for the very long, ſlender, projecting organs of fructification. If this ſpecies be carefully conſidered, it will perhaps be found to conciliate, in ſome meaſure, the differences between the diſcordant ones above deſcribed. Its *calyx* agrees moſt with the former, though neither keeled nor winged; its *corolla* with the latter; its habit is akin to both; its *ſtamens* peculiar to itſelf.

LISICZNIK, in *Geography*, a town of Poland, in Podolia; 28 miles W. of Kaminiec.

LISIEUX, a town of France, and principal place of a diſtrict, in the department of the Calvados, and before the revolution, the ſee of a biſhop. The place contains 10,192, and the canton 28,293 inhabitants, on a territory of 260 kiliometres, in 30 communes. N. lat. 49° 8′ 50″. E. long. 0° 13′ 32″.

LISIGNANO, a town of Iſtria; 14 miles E. S. E. of Pola.

LISKEARD, a borough and market-town in the hundred of Weſt and county of Cornwall, England, is ſituated partly on rocky hills and partly in a bottom; and through this inequality of the ground, the ſtreets have the appearance of being diſpoſed with ſtudied irregularity. The baſement ſtories of the houſes are conſequently diverſified; the foundations of ſome buildings being on a level with the chimnies of others. The church conſiſts of three ſpacious aiſles, and has a tower built moſtly of granite; the ſouth ſide of the church is ornamented with pinnacles and battlements, alſo of granite; but the greater part of the ſtructure is compoſed of ſlate-ſtone, which likewiſe conſtitutes the foundation of the town. The town-hall is ſupported on granite columns, in the ſpace between which a conſiderable market is held on Saturdays. Here are ſix annual fairs. On an eminence north of the town are the mouldering foundations of a caſtle, but every trace of its ſhape and architecture is nearly obliterated: near it is a large field, ſtill called Caſtle-park; but no fragments appear of the "Chapel of our Lady," mentioned by Browne Willis to have ſtood therein. There is, however, a houſe ſtanding at the bottom of the town, which, from its windows, gateway, and ſculptured ornaments, ſeems to have been connected with ſome religious eſtabliſhment. Liſkeard was conſtituted a free borough by Richard, brother to Henry III. by charter dated June 5, 1240. Queen Elizabeth, in the year 1580, granted a charter of incorporation, by which the civil government was veſted in a mayor, recorder, eight capital burgeſſes, and fifteen aſſiſtants, who, with the other freemen of the borough, elect two members of parliament. Liſkeard is 16 miles diſtant from Plymouth, and 237 from London: in the year 1800 the pariſh was returned to parliament as containing 507 houſes, and 2708 inhabitants.

In the pariſh of St. Cleer (to the north of Liſkeard) are various Druidical and other antiquities; particularly the Hurlers, which conſiſted, when perfect, of three contiguous circles of upright ſtones from three to five feet in height; the Cheeſe-Wring, a natural pile of rude rocks, riſing to the height of thirty-two feet; the Other Half-ſtone, which appears to have been the ſhaft of a croſs which originally ſtood upright. To theſe may be added, a cromlech of great magnitude, called Trevethey-ſtone. St. Cleer's well, of which ſome remains are ſtill extant, was in the times of ignorance and ſuperſtition eſteemed a bath of ſovereign virtue. South of Liſkeard is St. Keyne's well, which is claſſed by Carew among the natural wonders of Cornwall. Of this ſaint, and of the well, many poetical and legendary tales are extant. The ſpring is arched over, and on the mould which covers this arch five large trees are growing. Beauties of England and Wales, vol. ii.

LISLAU, a town of Bohemia, in the circle of Boleſlaw; ſix miles S. of Benatak.

LISLE, Claude de, in *Biography*, a celebrated French writer in hiſtory, was born at Lorrain in the year 1644.

He was received a member of the Jeſuits' college at Pont-à-Mouſſon, took his degrees in law, and was admitted an advocate. Conceiving, in a very ſhort time, a great diſlike to the law, he devoted himſelf to the ſtudy of hiſtory and geography. For the ſake of the ſuperior advantages to be obtained in the metropolis, he removed to Paris, and applied himſelf to the inſtructions of the moſt diſtinguiſhed profeſſors. Having obtained a large fund of knowledge on the ſubjects referred to, he commenced private lecturer, and acquired ſuch a high reputation in his profeſſion, that he could boaſt of having been maſter to the principal nobility at the French court. M. de Liſle died at Paris in 1720, in the ſeventy-ſixth year of his age. He was author of "An Hiſtorical Account of the Kingdom of Siam;" "A Genealogical and Hiſtorical Atlas, on engraved Plates;" "An Abridgment of Univerſal Hiſtory, from the Creation of the World to 1714," in 7 vols. 12mo.; and ſeveral other works, one of which was "An Introduction to Geography, with a Treatiſe on the Sphere;" publiſhed in 1740, in the name of his eldeſt ſon. Moreri.

Lisle, William de, a learned French geographer, ſon of the preceding, was born at Paris in 1675. He diſcovered at a very early age a genius for geographical ſtudies, and deſigned maps before he was nine years of age. In the year 1696 he publiſhed a map of the world, maps of the four quarters, as they are called, *viz.* Europe, Aſia, Africa, and America, a map of Italy, one of Ancient Africa, and two globes, a celeſtial and terreſtrial one. Theſe performances were not only well received, but eſtabliſhed the author's fame. In 1702 he was elected a member of the Academy of Sciences, and in 1718 he was appointed firſt geographer, with a penſion. He was about the ſame time appointed geographical tutor to the young king, Lewis XV., for whoſe uſe he drew up ſeveral works, among which was a general map of the world, and another of the retreat of the ten thouſand. He alſo gave the world "A Treatiſe on the Courſe of all the known Rivers." The reputation of M. de Liſle was now ſo great, that all authors of reſpectability who wrote on hiſtory or ſubjects connected with it, were deſirous of embelliſhing them with his maps; and many ſovereign princes endeavoured to tempt him to enter into their ſervice. The emperor, Peter the Great, paid him a viſit with the view of obtaining from him a knowledge of the extent and ſituation of his own dominions. He died in the fifty-firſt year of his age, while he was engaged in many uſeful and important works. Moreri.

Lisle, Lewis de, brother of the preceding, celebrated for his knowledge in aſtronomy, rendered ſome important ſervice to the intereſts of ſcience, by the hazardous journies and voyages which he undertook to promote them. In the year 1726 he went to Ruſſia with his brother Joſeph, who had been appointed aſtronomer to the Academy of Sciences at Peterſburg. Lewis, at this time, made excurſions beyond the utmoſt boundaries of the immenſe Ruſſian empire. He took ſeveral journies to the coaſts of the Icy ſea, to Lapland, and the government of Archangel, to determine the ſituation of the principal places by aſtronomical obſervations. He afterwards traverſed a great part of Siberia, with M. Muller and M. Gmelin, profeſſors of the academy at Peterſburg. In 1741 he proceeded alone to Kamtſchatka, and went from thence to Cape Beering, to examine the unknown northern coaſts of America, and the ſeas between them and the Atlantic continent. He died in the ſame year. On account of his great merit he obtained a ſeat in the Academy of Sciences, and was author of ſome papers in the "Memoirs" of that learned body, and of the Academy of Sciences at Peterſburg. Moreri.

Lisle, Joseph Nicholas de, younger brother of the preceding, was born at Paris in 1688. Having received a good education in the elements of learning, he attended lectures in the Mazarine college. The total eclipſe of the ſun which occurred in March 1706, led him to purſue with avidity mathematical learning, particularly in its application to aſtronomy, and he ſoon exhibited a ſurpriſing genius for invention, combination, and calculation. In 1709, he obtained leave to occupy the cupola of the Luxembourg palace for an obſervatory; he was now enabled to make a wooden quadrant, which he divided with great care, and which he found to anſwer his purpoſe in his early obſervations. Shortly after this, his father's numerous family made it neceſſary for him to endeavour to procure for himſelf the means of ſupport; and in doing this he found himſelf obliged to render his aſtronomical ſkill ſubſervient to the reveries of judicial aſtrology, for which he was not only remunerated by pecuniary preſents from the regent, marſhal de Noailles, and other great men, but had the grant of a penſion of 600 livres. This was in the year 1715, when he was deeply engaged in calculating the tables of the moon according to the theory of ſir Iſaac Newton. He had, previouſly to this, been elected a member of the Academy of Sciences, which gave new energy to his exertions, and the memoirs of that body were in a ſhort time enriched with his valuable reflections and diſſertations. He made many obſervations on the ſpots in the ſun, and was led to form from them a theory to determine the ſun's rotation on his axis. In 1720 he delivered a propoſal to the Academy for aſcertaining in France the figure of the earth, and ſome years afterwards his deſigns relative to that object were carried into execution. In 1724, M. de Liſle paid a viſit to England, obtained the notice and friendſhip of Newton and Halley, and was admitted a fellow of the Royal Society. In 1726, by the invitation of Catharine, empreſs of Ruſſia, he went to Peterſburg, to fill the poſt of aſtronomer royal in the Imperial Academy of Sciences. In this ſituation he occupied the houſe of the obſervatory built by Peter the Great, in which he ſpent nearly twenty-one years, in inceſſant labours for the improvement of aſtronomy and geography. The firſt ſeries of his obſervations were employed in aſcertaining the longitude and latitude of Peterſburg, and the refractions in that northern region. After this he devoted ſeveral years to an aſſiduous obſervation of the meridional height of all the planets, and of the fixed ſtars of the three firſt magnitudes, and publiſhed memoirs illuſtrative of the hiſtory of aſtronomy, in two vols. 4to. In the year 1740, a tranſit of Mercury was expected, which, as it would not be viſible in Europe, he was determined to travel into Aſia to obſerve. His firſt obſervations in the climate of Siberia, were on the intenſeneſs of the cold, which was greater than had ever been pointed out by a thermometer, or than it was conceived poſſible for human nature to ſuſtain. He publiſhed a memoir on this ſubject in the volume of the Tranſactions of the French Academy for 1749. When the time for obſerving the tranſit arrived, the cloudineſs of the weather totally fruſtrated the deſign of his journey. His time and labour were not however wholly loſt, as he employed himſelf in making geographical and phyſical obſervations, and in drawing up a deſcription of the country, which deſcription is inſerted in the eighteenth volume of Querlon's Hiſtory of Travels, &c. Another fruit of his expedition into the Ruſſian dominions, was an atlas of the country, firſt publiſhed in the Ruſſian language, and afterwards in the Latin. Connected with his meteorological obſervations, he conſtructed a thermometer, which was differently graduated from thoſe then in uſe: the degrees began at the heat of boiling water, and thence increaſed to 150, which was the freezing point. In the year 1747, after much ill treatment on the part of the Ruſſian government, he obtained his diſmiſſion, left Peterſburg in the month of May, and arrived in Paris in September of the ſame year. On his return he was appointed profeſſor of the mathematics at the college royal, in which ſituation he lived to render the greateſt ſervice to the intereſts of ſcience, by training up pupils worthy of ſuch a maſter, among whom was the celebrated M. de la Lande. He now fitted up and furniſhed an obſervatory, in which he continued his labours, without interruption, for ſeveral years. In the year 1748, his pupil M. Monnier took a voyage to Scotland to obſerve an annular eclipſe of the ſun, which furniſhed an opportunity for meaſuring the diameter of the moon at the time when it ſhould be entirely viſible on the ſun's diſk. On this ſubject De Liſle publiſhed a large advertiſement, which was reckoned a complete treatiſe on annular eclipſes. He afterwards entered more fully on the conſideration of the theory of eclipſes, and he communicated a part of his reſearches on the ſubject to the Academy in 1749. He was ſo expert in calculations, that he made many founded on the obſervations of Greenwich, Berlin, Scotland, and Sweden. He publiſhed "New Charts of the Diſcoveries of Admiral de Fonte, or Fuente, made in 1640, and thoſe of other navigators, Spaniſh, Portugueſe, Engliſh, Dutch, French and Ruſſian, in the Northern ſeas, with explications." This work was preſented to the public in 1750 and 1753. In the latter of theſe years he publiſhed a curious map of the world, in which he repreſented, for the benefit of aſtronomers impatiently waiting for the tranſit of Mercury over the ſun, the effect of the parallaxes of Mercury in different countries, in order to point out the proper places for making ſuch obſervations on the tranſit, as ſhould, from the difference of their reſult, furniſh a method of determining the diſtance of the ſun, in a manner ſimilar to that applied by Halley to the tranſit of Venus. Another work of this laborious and indefatigable philoſopher, publiſhed in the Tranſactions of the Academy, was on the comet of 1758, which had been firſt diſcovered by a peaſant in the neighbourhood of Dreſden, and which was viſible ſeveral months; but he was principally attentive to the one predicted by Dr. Halley, forty years before, as to make its appearance in 1759, and which was firſt ſeen in January of that year. He gave an account of his obſervations on that comet in the firſt volume of the "Mercure," for July 1759. He was afterwards aſſiduouſly engaged on the ſubject of the tranſit of Venus, which was expected in 1761, in order that he might correct the error of Halley, and thus prevent perſons from undertaking long voyages for the ſake of obſerving it, whoſe labours would have proved uſeleſs with reſpect to the object in view.

M. de Liſle had, ſome years previouſly to this, been appointed aſtronomical geographer to the marine, an office which had been eſtabliſhed many years, with the expreſs view of having a depôt, in which might be preſerved all the deſigns, plans, charts, &c. of the coaſts of France, and of the colonies and eſtabliſhments in different parts of the world, with the memoirs relating to them: to M. de Liſle's office was attached the buſineſs of collecting and arranging the plans and journals of naval captains, and to extract from them whatever might be found beneficial to the king's ſervice in this department. His majeſty now purchaſed, with a penſion for life, all M. de Liſle's rich aſtronomical and geographical collections, which were added to the MSS. in the depot. In the year 1758, our author felt ſome ſymptoms of decline, and withdrew as much as he could from public life, leaving the care of his obſervations to M. Meſſier, and obtaining from the miniſter the appointment of M. de la Lande for his coadjutor at the college royal. He went to reſide at the abbey of St. Genevieve, where he ſpent much of his time in devotional exerciſes, and devoted the greateſt part of his income to acts of benevolence and charity. In his retirement he cheriſhed his taſte for aſtronomy and geography, correſponded with men of ſcience, read new works, and even ſelected ſome of his own in MS. with a view to publication. He died on the 11th of July 1768, being in the 81ſt year of his age. As a man of ſcience his merits are very great, and in private life he was diſtinguiſhed by unaffected piety, pure morals, undeviating integrity, and moſt amiable manners. Gen. Biog.

Liſle de la Drevetiere, Lewis-Francis de, a French dramatic writer, was deſcended from a noble family, and born in the province of Dauphinè. His friends intended him for the bar, but his own inclinations were decidedly againſt the profeſſion of the law, and as his father could not ſupport him in the ſtyle which his diſſipated turn required, he was reſolved to maintain himſelf by his talents, and began to write for the Italian theatre. In 1721 he preſented for public exhibition his comedy of "Arlequin Sauvage," which was ſucceſsful, and which is even now occaſionally brought before the public. His "Timon le Miſanthrope" acquired a much larger ſhare of popularity: he publiſhed and brought on the ſtage many other pieces, chiefly of the comic caſt: and he compoſed a tragedy entitled "Danaus," and a poem entitled "Eſſai ſur l'Amour Propre;" which, with ſeveral other pieces, were collected in a ſingle volume. He died in 1756, and has been deſcribed as a haughty, taciturn, and thoughtful character.

Liſle, in *Geography*,. See **Lille**.

Liſle, a town of France, in the department of the Dordogne; 9 miles N.W. of Perigueux.—Alſo, a town of France, in the department of the Yonne; 24 miles S.E. of Auxerre.

Liſle, a poſt-town of America, in Tioga county, New York; through which paſſes a branch of the Chenengo, uniting with the Chenengo in the S.E. corner of the townſhip. It contains 660 inhabitants.

LISLENA, a town of Sweden, in the province of Upland; 16 miles S.S.W. of Upſal.

LISMORE, an iſland of the Hebrides, in the county of Argyle, Scotland. It is ſituated at the mouth of the great arm of the ſea called Loch-Linnhe, and extends about ten miles in length and two in breadth. The whole of this iſland lies on a ſtratum of excellent lime-ſtone, unfortunately rendered of little value to the inhabitants by the deficiency of fuel to burn it. Mr. Pennant ſays the derivation of its name is from *Lioſmor*, or the great garden. According to tradition, however, it was not a garden, but a deer-foreſt, and as a proof of this, multitudes of ſtags' horns of uncommon ſizes are frequently dug up in the moſſy parts of it. At preſent there is very little wood, but the ſoil being fertile, the leſſer vegetables ſhoot up with uncommon vigour. The chief productions of the ground are beans and oats. The former are moſtly applied to the purpoſes of diſtillation; and the latter go to the diſcharge of rents, ſo that the inhabitants are obliged to import large quantities of meal for their ſubſiſtence. There are a conſiderable number of cattle reared in this iſland, but they are generally of very ſmall ſtature. The author already mentioned thinks they muſt have greatly degenerated from their original growth, for he informs us that he ſaw the ſkull of an ox dug up here, which was of much larger dimenſions than any now living in Great Britain. About a hundred head of the largeſt are exported annually. The horſes bred here are extremely ſhort-lived.

They are harneſſed when only two or three years old, which practice will no doubt aſſiſt in ſhortening the period of their exiſtence. Neither foxes, hares nor rats can be found in the iſland; otters and mice however are abundant. It contains three ſmall lakes, two of which are famed for excellent trout, and the third for eels.

Liſmore was formerly the ſeat of the biſhop of Argyle, who was thence ſtyled Epiſcopus Liſmorenſis. Mr. Pennant ſays there are no remains either of the cathedral or the biſhop's palace. In the Beauties of Scotland, however, it is aſſerted, that veſtiges of both are ſtill to be ſeen, The chancel of the former is there ſtated to be uſed as the pariſh church, and the walls of the latter are ſaid to be pretty entire, and diſtant about four miles from the cathedral. Several fortified camps can yet be diſcovered in different parts of the iſland. A Daniſh fort, ſurrounded by a deep foſſe, is likewiſe in tolerable condition. The walls are now 17 feet high, having a gallery within, and round the area a ſtone ſeat, which Mr. Pennant ſuppoſes might have been intended as a general reſting place for the chieftains and their ſoldiers. The church, ſays the ſame author, in conformity with his aſſertion that there are no remains of the cathedral, "is a mean modern building." In the church-yard ſeveral old monuments are ſtill ſtanding, one of which is very remarkable, as conſiſting of nothing more than a thick log of wood. Its antiquity muſt be very great, as there is no word in the Erſe language to denote this kind of monument. On a rock are cut the radii of a dial, but the index is deſtroyed. A ſmall baſin is excavated in another rock, which was probably uſed by the Druids in ſome part of their religious ceremonies.

There is no ſpecial return of the number of inhabitants in this iſland, but they are reckoned to exceed 1100 ſouls. Pennant's Tour in Scotland. Beauties of Scotland.

Liſmore, a poſt-town of Ireland, on the river Blackwater, and in the county of Waterford. The bridge over the river is a fine erection of the duke of Devonſhire's. The ſpan of the principal arch is 190 feet. There are excellent ſalmon weirs at this place, which return a conſiderable profit. The appearance of Liſmore from the bridge is awfully ſublime and intereſting. The caſtle is ſeated upon a rock, which riſes in perpendicular ſhelves from the river to a tremendous height. The rude rocks are richly crowned with trees, whoſe verdant boughs in ſome parts embrace the placid ſtreams, and in others aſcend to ſhelter the ruined towers, and ſhade the antique windows of the fort. This venerable and extenſive caſtle, the property of the duke of Devonſhire, was built by king John, in 1185, on the ruins of the abbey of St. Carthagh. It afterwards became the epiſcopal reſidence, till Myler Megrette, biſhop of the ſee, conveyed it to ſir W. Raleigh. From ſir Walter it was purchaſed, with the reſt of his property in Ireland, by Richard Boyle, afterwards the firſt earl of Cork, and his youngeſt ſon, the celebrated and deſervedly eſteemed philoſopher Robert Boyle, was born in it. It has ſince become the property of the duke of Devonſhire, who is deſcended by the female line from the eldeſt branch of the Boyle family. In the town of Liſmore are a neat court-houſe, in which the ſeſſions are held, a ſmall priſon, and a very reſpectable inn. The church, which ſerves both as a pariſh church and as the cathedral of the biſhopric, is old, and was lately in indifferent repair; it is however, according to Dr. Beaufort, ſpacious and handſome, and will probably be thoroughly repaired. The dean of Liſmore has a peculiar juriſdiction over this, and two adjoining pariſhes. It has been already mentioned that St. Carthagh founded an abbey here. This was in the ſeventh century, and the abbey was erected into a biſhopric in 633. A number of monks repairing hither, ſeveral churches and cells were built, and theſe being uſually the ſeat of any learning that exiſted during the middle ages, a ſchool was ſoon inſtituted, which, for a long period, became the great reſort both of natives and foreigners. In 1536, this ſee was united to that of Waterford, under which an account of it will be given. Before the union, Liſmore returned two members to the houſe of commons, but this privilege has ceaſed. It is 101 Iriſh miles S.W. by S. from Dublin, and 26 N.E. from Cork. Beaufort, Robertſon, &c.

LISNAKEA, a poſt-town of Ireland, in the county of Fermanagh; 70 miles N.E. from Dublin.

LISS, a town of Holland; eight miles N. of Leyden.

LISSA, a town of Sileſia, in the principality of Breſlaw, on the Weiſtritz; ſeven miles W.N.W. of Breſlaw. N. lat. 51° 7′. E. long. 16° 50′.

Lissa, anciently *Iſſa*, (which ſee,) an iſland of the Adriatic, near the coaſt of Dalmatia, once famous for the commerce, wealth, and power of its inhabitants, is a mountainous and thinly inhabited iſland, 30 miles in circuit. In many parts the ſoil is good, but not ſufficiently cultivated. In its ancient ſtate it was in alliance with Rome, and carried on war againſt the kings of Illyrium; but with the decline of the Roman empire, it ſunk into a ſucceſſive dependence on Narenta, Leſina, and Venice. Its mountains contain marble, and are interſected by fertile vallies. It produces wine, fruits, and excellent honey. But its principal ſource of wealth is its fiſhery, particularly that of ſardines. The ruins of its capital of the ſame name appear above the harbour, near a village of the ſame name. It has alſo a well-built populous town, called "Comiſa," near the ſea, on the E. ſide of the iſland, where are the ruins of the ancient city of Meo. N. lat. 43° 25′. E. long. 16° 18′.

Lissa, or *Lechno*, a town of the duchy of Warſaw; raiſed from the condition of a village to that of a town, by the influx of Proteſtants driven by perſecution from Sileſia, Bohemia, Moravia, and Auſtria. The inhabitants carry on a good trade. In this town are a Lutheran and alſo a Calviniſt church, and a ſeminary; 44 miles S.S.W. of Poſen. N. lat. 51° 55′. E. long. 16° 35′.

Lissa, or *Thynnus Lyſſa*, in *Ichthyology*, a name by which ſome authors have called the fiſh more uſually called *gliſſa*, a large ſea-fiſh of the tunny kind.

LISSABATTA, in *Geography*, a town on the N. coaſt of the iſland of Ceram, inhabited by an aſſemblage of different people, which have been troubleſome to the Dutch. S. lat. 2° 55′. E. long. 128° 44′.

LISSANTHE, in *Botany*, ſo named by Mr. R. Brown, from λισσος, *ſmooth*, and ανθη, *a flower*, becauſe of the naked and beardleſs limb of the corolla; that part being denſely covered with hairs in *Leucopogon*, and more or leſs fringed or tufted in ſeveral other genera, of the ſame natural order, found in New Holland. Brown Prodr. Nov. Holl. v. 1. 540. Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Epacrideæ*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of five equal, concave, permanent leaves, ſometimes accompanied by two rather ſmaller ones at the baſe. *Cor.* of one petal, funnel-ſhaped; tube nearly cylindrical, generally hairy within; limb in five lanceolate, equal, ſpreading, beardleſs ſegments. Nectary a five-lobed gland, at the baſe of the germen. *Stam.* Filaments five, ſhort, within the tube; anthers roundiſh, of two cells, burſting lengthwiſe. *Piſt.* Germen ſuperior, globular, with five ſlight angles; ſtyle pentagonal, rigid, ſhorter than the tube; ſtigma obtuſe. *Peric.* Drupa ſucculent. *Nut* hard, of five cells.

Eſſ. Ch. Calyx of five or ſeven leaves. Corolla funnel-ſhaped; its limb beardleſs. Stamens inſerted into the tube, very ſhort. Drupa ſucculent. Nut hard, of five cells.

Mr. Brown defines ſix ſpecies of this genus, ſeparated by him from the *Styphelia* of preceding botaniſts, which are diſpoſed in three ſections. They are ſmall, rigid, upright ſhrubs; with ſcattered leaves, furrowed beneath; and rather ſmall white flowers.

Sect. 1. *Calyx of only five leaves. Cluſters axillary, of few flowers, their partial ſtalks furniſhed with a pair of bracteas at the baſe. Tube of the corolla hairy within.*

1. L. *ſapida.* "Cluſters of two or three flowers, recurved. Leaves oblong-linear, ſharp-pointed, revolute; white and ſtriated beneath." Br.—Gathered by Mr. Brown near Port Jackſon, New South Wales.—By the name, we preſume the fruit is eatable.

2. L. *ſubulata.* "Cluſters of four or five flowers, erect. Leaves linear-awlſhaped. Branches ſmooth. Fruit with ten furrows."—Gathered by Mr. Brown in the ſame country. The *leaves* are about half an inch long.

3. L. *ſtrigoſa.* (Styphelia ſtrigoſa; Sm. New Holl. 48.) Cluſters collected towards the ends of the branches, erect, of few flowers. Leaves linear-awlſhaped. Branches downy. Drupa with five ſlight angles.—Sent from Port Jackſon by Dr. White in 1793. Found there alſo, as well as in Van Diemen's land, by Mr. Brown. The *ſtem* is ſhrubby, rigid, finely downy, with numerous, ſhort, crowded, leafy, lateral branches. *Leaves* ſcattered, ſometimes imperfectly whorled, nearly ſeſſile, about half an inch long, rigid, pungent, revolute; ſmooth, even and convex above; ribbed beneath. *Cluſters* axillary and terminal, generally crowded about the ends of the branches, ſhort, erect, of very few flowers, their ſtalk downy, with ſeveral pale, concave, fringed *bracteas*. *Calyx-leaves* like the bracteas. Tube of the *corolla* thrice as long as the calyx; limb acute, one-third the length of the tube. *Anthers* riſing juſt above the mouth, accompanied by a few erect hairs from the inſide of the tube. *Germen* and lower part of the *ſtyle* clothed with fine, ſhort, hoary down.

Sect. 2. *Calyx of ſeven leaves. Corolla ſhort, its tube and mouth without hairs. Spikes axillary, of few flowers,*

4. L. *montana.* "Leaves oblong-linear, obtuſe, pointleſs; glaucous beneath."—Gathered by Mr. Brown at Van Diemen's land.

Sect. 3. *Calyx of ſeven leaves. Corolla elongated, its mouth beſet with deflexed hairs within the tube. Flowers axillary, ſolitary.*

5. L. *daphnoïdes.* (Styphelia daphnoides; Sm. New Holl. 48.)—Leaves elliptic-lanceolate, ſlightly concave, with a blunt callous point; their edges naked, roughiſh. Sent from Port Jackſon by Dr. White, in 1792. Mr. Brown found it both in the tropical part of New Holland, and in Van Diemen's land. The *ſtem* is much branched, leafy, and finely downy. *Leaves* ſcattered, from $\frac{1}{4}$th to $\frac{3}{4}$ths of an inch long, very various in breadth, more or leſs elliptical, ſmooth, ſlightly concave, entire; minutely roughiſh at the edges; furniſhed with numerous branching ribs beneath. *Flowers* numerous, axillary, ſolitary, on ſhort hairy ſtalks. *Calyx-leaves* all nearly of equal ſize and appearance, ovate, pointed, ſmooth, finely fringed, two of them external. *Corolla* much like that of *L. ſtrigoſa*, but with rather longer and narrower ſegments, whoſe upper ſide appears, as far as we can judge from the dried plant, to be finely downy from their baſe to the middle. Mr. Brown however, who ſaw it alive, deſcribes this part as entirely ſmooth. The aſpect of this pretty ſpecies is much like that of ſome of the ſmaller kinds of *Daphne*.

6. L. *ciliata.* "Leaves elliptic-lanceolate, flat, with a pellucid point; their edges finely ſerrated and fringed. Limb of the corolla roughiſh."—Gathered by Mr. Brown in Van Diemen's land. We have ſeen no ſpecimens of this ſpecies, nor of any others, except the third and fifth, nor do we know of any of them being introduced into the gardens of this country.

LISSER, in *Geography*, a town of Perſia, in the province of Ghilan; 60 miles N.W. of Reſhd.

LISSOUEN, a town of Pruſſia, in Natangen; 15 miles S. of Marggrabowa.

LISSUS, in *Ancient Geography*, a town of Illyria, in Dalmatia, between the mouth of the Drin and the frontier of Macedonia. Ptolemy. Pliny calls it "Liſſum Oppidum," and adds that it was a colony of Roman citizens, 100 miles from Epidaurus, where Macedonia commenced.

LIST, in the *Manufactures*, denotes the border of a ſtuff, or that which bounds its width on each ſide.

Du-Cange derives the word from *liciæ*, which, in the age of corrupt Latin, was uſed for the incloſures of fields and cities, as being anciently made with cords interlaced; or from *liſtæ, quia campum claudebant inſtar liſtarum panni*; as incloſing the ground after the manner that a liſt does a piece of cloth.

All cloths, and ſtuffs of ſilk, wool, or cotton, have liſts. Liſts contribute to the goodneſs of the ſtuff, and farther ſerve to ſhew their quality; which has given occaſion to ſeveral regulations relating to their matter, colour, work, &c.

List is alſo uſed to ſignify the incloſed field, or ground, wherein the ancient knights held their juſts and combats. It was ſo called as being hemmed round with pales, barriers, or ſtakes, as with a liſt.

Some of theſe were double, one for each cavalier; which kept them apart, ſo that they could not come nearer each other than a ſpear's length. See Tournament, and Duel.

List, *Liſtel*, or *Liſtello*, in *Architecture*, called alſo *cincture*, *fillet*, *ſquare*, and *reglet*, is a little ſquare moulding, ſerving to crown or accompany larger mouldings; and, on occaſion, to ſeparate the flutings of columns.

List, in the *Sea Language*, the ſame with *Luſt*.

List, *Civil.* See Civil *liſt*, and Revenue.

LISTENING, according to Rohault, conſiſts in extending or bracing the tympanum of the ear, and putting it into ſuch a condition, as that it ſhall be the more affected by any tremulous motion of the external air. See Ear.

Listening, in the *Manege*, as when we ſay a horſe goes a liſtening pace. See Ecoute.

Listening *Trumpet*. See Trumpet.

LISTER, Martin, in *Biography*, a phyſician and naturaliſt, was born about 1638. He was of a Yorkſhire family, (ſettled in Buckinghamſhire,) which produced a conſiderable number of medical practitioners of reputation; among whom was ſir Matthew Liſter, phyſician to Charles I., and preſident of the College of Phyſicians. Martin was educated under the direction of his uncle, ſir Matthew, and ſent to St. John's college, Cambridge, where he took his firſt degree in arts in 1658. In 1660 he was made fellow of his college by royal mandate. Having made choice of the profeſſion of medicine, he purſued his ſtudies with zeal, and travelled to the continent for the purpoſe of farther improvement. On his return in 1670, he ſettled at York, where he practiſed his profeſſion for many years with conſiderable reputation. At the ſame time he applied all the leiſure, which his avocations allowed him, to the inveſtigation of the natural hiſtory and antiquities of the north of England; and having communicated ſeveral papers on theſe ſubjects to the Royal Society, he was elected a fellow of that body. He contributed many coins, altars, and other antiquities, together with a great number of valuable natural curioſities, to the Aſhmolean muſeum at Oxford. His various productions having made him well known to the learned in the kingdom, upon the ſolicitation of his friends he removed to London in the year 1684. He was at that time created doctor of phyſic by diploma at Oxford, upon the particular recommendation of the chancellor; and was ſoon afterwards elected a fellow of the College of Phyſicians. In 1698 he accompanied the earl of Portland in his embaſſy from king William to the court of France; when, having obtained introductions to the moſt eminent men of ſcience at Paris, he viewed all the curioſities of that capital. On his return he publiſhed an account of this journey, which contained ſome things of a trifling nature, and gave occaſion to a burleſque imitation, entitled "A Journey to London," by Dr. William King. At that time, indeed, when the ſtudy of natural hiſtory was little attended to, a man who had written on ſnails and ſpiders, and beſtowed his attention on the minuteſt parts of natural knowledge, was particularly liable to incur the ridicule of wits. In conſequence of the illneſs of Dr. Hannes, in 1709, Dr. Liſter was made ſecond phyſician in ordinary to queen Anne; an appointment which he did not hold long; for he died in February 1711-12.

The medical writings of this phyſician are not void of valuable obſervations, deduced from his own experience; but they are marked by a propenſity to hypotheſis, and too ſtrong an attachment to ancient doctrines. Theſe are two works on Engliſh medicinal waters, entitled "De Fontibus Medicatis Angliæ, Exercitatio nova et prior," 1682, "altera," 1684: "Exercitationes ſex Medicinales, de quibuſdam morbis chronicis," 1694, which was republiſhed, with additions, in 1697. The diſeaſes here treated of are dropſy, for which he recommends the uſe of draſtic purgatives; diabetes, hydrophobia, ſyphilis, for which he admits that mercury is a ſpecific, but avers that the mercury itſelf requires an antidote, which is found in the guaiacum; ſcurvy, gout, ſtone, and ſmall-pox, for which laſt he extols the remedial effects of the alexipharmic medicines, and condemns the cooling practice introduced by the ſagacious Sydenham. In general, indeed, he is a keen controverſialiſt, and indulges in ſevere remarks upon ſome of his contemporaries, eſpecially Sydenham. In his "Diſſertatio de Humoribus," 1709, which is full of hypotheſes, he is not leſs ſevere in his treatment of Drake and Ruyſch.

The reputation of Liſter is principally founded on his reſearches in natural hiſtory and comparative anatomy. He publiſhed nearly forty papers in the Philoſophical Tranſactions, Nos. 25 to 585 incluſive, in addition to the following works. "Hiſtoriæ Animalium Angliæ Tractatus tres: unus de Araneis: alter de Cochleis, tum terreſtribus, tum fluviatilibus: tertius de Cochleis marinis," 1678, 4to. "Exercitatio Anatomica de Cochleis maxime terreſtribus et Limacibus," 1694, 8vo. "Exercitatio Anatomica altera de Buccinis fluviatilibus et marinis," 1695, 8vo. "Exercitatio Anatomica tertia Conchyliorum bivalvium," 1696, 4to. In all theſe works Dr. Liſter has diſplayed great accuracy of obſervation, and indefatigable induſtry, in detecting the moſt minute and curious particulars of the economy of theſe creatures. He alſo edited a correct and better arranged copy of Goedart's Treatiſe on Inſects, in 1685; and an edition of Sanctorius's "Medicina Statica," with a commentary, in 1701. His "Journey to Paris," notwithſtanding the efforts of ridicule, was well received, and contains a variety of curious matter. Gen. Biog. Hutchinſon, Biog. Med. Eloy Dict. Hiſt.

LISTERLAND, in *Geography*, a cape on the S. coaſt of Norway; 20 miles N.W. of Lindeſneſs.

LISTING, or INLISTING, in *Military Language*, denotes the retaining and enrolling ſoldiers, as volunteers, for the national ſervice. When any perſon is inliſted as a ſoldier, he ſhall within four days, but not ſooner than twenty-four hours, be taken before the next juſtice of peace, or chief magiſtrate of a town corporate, not being an officer in the army; and before him ſhall be at liberty to declare his diſſent to ſuch inliſting; and on ſuch declaration, and returning the inliſting money, and paying 20*s.* for the charges expended on him, he ſhall be forthwith diſcharged, in preſence of ſuch magiſtrate. But if he ſhall refuſe or neglect in twenty-four hours to return and pay ſuch money, he ſhall be deemed to be inliſted, as if he had given his aſſent before the magiſtrate. If he declare that he voluntarily inliſted himſelf, the magiſtrate ſhall certify under his hand, that ſuch perſon is duly inliſted, ſetting forth the place of his birth, age, and calling, if known; and that the third and fourth articles of the ſecond ſection, and the firſt article of the ſixth ſection of the articles of war againſt mutiny and deſertion were read to him, and that he has taken the oaths mentioned in the ſaid articles of war; *viz.* the oath of fidelity and the oaths in the ſchedules marked A and B; except in the caſe of recruits inliſted either in his majeſty's ſervice or in the Eaſt India company's forces under 39 Geo. III. c. 109, in which caſe each recruit ſhall, inſtead of the ſaid oath of fidelity, and that contained in the ſchedule A or B, take the oath of allegiance directed by the 39th of the king, and contained in ſchedule E, and the juſtice or magiſtrate ſhall certify ſuch inliſtment and ſwearing according to the ſchedule F; and if any perſon ſo certified as duly inliſted ſhall refuſe to take the ſaid oath of fidelity before ſuch magiſtrate, &c. the officer, from whom he hath received ſuch money, may detain and confine him till he ſhall take it; and every military officer that ſhall herein offend, ſhall be caſhiered and diſplaced from their office, and diſabled from holding any military poſt, and forfeit 50*l.* See FOREIGN *ſervice.*

LISTOWHILL, or LISTOWELL, in *Geography*, a poſt-town of Ireland, in the county of Kerry, ſituated on the river Feale. The caſtle, on the ſummit of a ſteep precipice above the river, was the laſt ſtrong hold which held out againſt queen Elizabeth in 1600. It is 131 miles S.W. by W. from Dublin, and 13 N.E. from Tralee.

LISTVENNISCHNA, a town of Ruſſia, in the government of Irkutſk, on the Argun, on the confines of China. N. lat. 51° 44′. E. long. 121° 20′.

LIT, a town of Sweden, in Jamtland; 10 miles N. of Oſterſund.

LITA, in *Botany*, ſo named by Schreber, from λιτος, *ſimple*, *naked*, or *deſtitute*, becauſe the plant conſiſts chiefly of flowers, with a very trifling ſtem, and no leaves, but a few ſmall ſcales. Schreb. 795. Willd. Sp. Pl. v. 1. 1071. Mart. Mill. Dict. v. 3. (Voyria; Aubl. Guian. v. 1. 208. Vohiria; Juſſ. 141. Lamarck Illuſtr. t. 109.—Claſs and order, *Pentandria Monogynia.* Nat. Ord. *Rotaceæ*, Linn. *Gentianæ*, Juſſ.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, tubular, erect, coloured, five-cleft, acute, permanent. *Cor.* of one petal, ſalver ſhaped; tube cylindrical, very long, dilated at the top and bottom; limb in five equal, ovate, ſpreading, deep ſegments. *Stam.* Filaments ſcarcely any; anthers five, roundiſh, two-lobed, nearly ſeſſile, in the throat of the tube. *Piſt.* Germen ſuperior, ovate-oblong; ſtyle thread-ſhaped, the length of the tube; ſtigma capitate, abrupt. *Peric.* Capſule oblong, of one cell and two valves. *Seeds* very numerous, minute, chaffy, attached to the inflexed margins of the valves.

Eſſ. Ch. Corolla ſalver-ſhaped. Anthers ſeſſile, within the tube. Stigma abrupt, undivided. Capſule of one cell and two valves.

1. L. *roſea.* Willd. n. 1. (Voyria roſea; Aubl. Guian. v. 1. 209. t. 83. f. 1.)—Flowers in pairs. Segments of the corolla acute. Root tuberous.—Gathered by Aublet in the foreſts of Guiana, where the natives call it *Voyria,* and eat the roaſted *root,* which is tuberous, reſembling a potatoe in ſhape and flavour, and throws out various ſpreading fibres. The *ſtem* is ſolitary, ſeveral inches long, chiefly concealed under the ground, ſquare, knotty, ſmooth, bearing ſeveral, oppoſite or ternate, little, acute, fleſhy ſcales, inſtead of *leaves,* in the manner of a *Lathræa,* and dividing at the top, where it riſes above the ſurface, into ſeveral branches about an inch long, with more frequent knots, and rather larger ſcales. Each branch bears two large and handſome, roſe-coloured *flowers,* whoſe *tube* is near two inches long, ſwelling at the top as well as at the baſe, but contracted again at the orifice. The *limb* is about half an inch in diameter, ſpreading like a ſtar, with ſharp points. *Calyx* ſhort, bell-ſhaped. Sometimes the *flowers* are ſolitary.

2. L. *cærulea.* Willd. n. 2. (Voyria cærulea; Aubl. Guian. v. 1. 211. t. 83. f. 2.)—Flowers in pairs. Segments of the corolla rounded, obtuſe. Root tuberous.—Native of palm foreſts in Guiana, where it bloſſoms in May. This differs from the preceding in having blue *flowers,* whoſe limb is larger, with round or obovate blunt ſegments, and a more dilated orifice; as well as a more deeply cut calyx. Aublet ſays the flowers are occaſionally ſix-cleft, with ſix *ſtamens.*

3. L. *lutea.* (Gentiana aphylla; Jacq. Amer. 87. t. 60. f. 3. Helleborine aphyllos, flore luteo; Plum. Cat. 9?)—Stems ſimple, ſingle-flowered. Segments of the corolla acute. Root fibrous, faſciculated. Gathered by Jacquin, flowering in May as well as December, in the extenſive damp mountainous foreſts of Martinico. It is a ſmall and tender plant, evidently akin, as Aublet remarks, to his two ſpecies above deſcribed; though the *root* conſiſts only of thick entangled fibres. *Stems* four inches high, of a ſhining ſtraw-colour, jointed, ſingle-flowered, bearing ſeveral pairs of minute, oppoſite, acute ſcales. *Flowers* an inch long, ſlender, yellowiſh, inodorous, with a ſmall, acute, ſtellated border. Their *ſtigma* is deſcribed as ſimple, capitate, and obtuſe, as it ought by analogy to be, though in the figure repreſented cloven.

LITADA, in *Geography,* a town of the iſland of Negroponte, in the Grecian Archipelago; 48 miles N.W. of Negroponte.

LITANY, an old church term, applied to the proceſſions, prayers, and ſupplications uſed for appeaſing the wrath of God, averting his judgments, or procuring his mercies.

The word comes from the Greek λιτανεια, *ſupplication;* of λιτανεύω, *I beſeech.* Pezron would go farther, and derive the λιτομαι, or λισσομαι, of the Greeks, from the Celtic *lit, feaſt, ſolemnity.*

Eccleſiaſtical authors, and the Roman order, by the word litany uſually mean the people who compoſe the proceſſion, and aſſiſt at it; and Du-Cange obſerves, that the word anciently ſignified *proceſſion.*

Simon of Theſſalonica mentions, that, in the ancient litanies, the people went out of the church, to denote the fall of Adam; and returned into it again, to ſhew the return of a pious ſoul to God by repentance.

Litany, in a modern ſenſe, denotes a form of prayer, ſung or ſaid in churches; conſiſting of ſeveral periods, or articles; at the end of each of which is an invocation in the ſame terms.

Before the laſt review of the common prayer, the litany was a diſtinct ſervice by itſelf, and uſed ſome time after the morning prayer was over. At preſent it is made one office with the morning ſervice, being ordered to be read after the third collect for grace, inſtead of the interceſſional prayers in the daily ſervice.

It has been obſerved, that none but thoſe who are avowed Trinitarians can conſcientiouſly join in this part of the church ſervice; it has been alſo obſerved, that in the petition to be delivered from "all deadly ſin," there ſeems to be an intimation of the popiſh doctrine of venial and mortal or deadly ſin, and that the petition in the maſs-book, from which a great part of the litany is taken, for deliverance from "ſudden death," is more guardedly expreſſed, "à ſubitâ et improviſâ morte," *i. e.* from death ſudden and unprovided for.

LITAO, in *Geography,* a town on the N.W. coaſt of the iſland of Timor. S. lat. 9° 2'. E. long. 124° 42'.

LITCHFIELD. See Lichfield.

Litchfield, a townſhip of America, in Lincoln county, Maine, 45 miles from Hallowell; containing 1044 inhabitants.—Alſo, a townſhip in Hillſborough county, New Hampſhire, ſituated on the E. ſide of Merrimack river, about 54 miles W. of Portſmouth: ſettled in 1749 and containing, in 1800, 372 inhabitants.—Alſo, a populous and hilly county of Connecticut, bounded N. by Maſſachuſetts, S. by New Haven and Fairfield counties, E. by Hartford, and W. by New York. It is divided into 20 townſhips, containing 41,214 inhabitants. Although the face of the country is generally mountainous, the ſoil is fertile, yielding large crops of wheat and Indian corn, and affording fine paſture. The inhabitants are almoſt univerſally farmers, and wholly detached from maritime commerce.—Alſo, the chief and poſt-town of the above county, ſeated on an elevated plain, expoſed to the cold winds of winter, but enjoying a large portion of the refreſhing breezes of ſummer. Its ſituation is handſome, and it contains about 60 or 70 compact dwelling-houſes, a court-houſe, a meeting-houſe, and 4285 inhabitants; 32 miles W. of Hartford. N. lat. 41° 46'. W. long. 73° 37'. On ſeveral ſmall ſtreams, ſome of which fall into Great Pond, a beautiful ſheet of water, are three iron-works, an oil-mill, and a number of ſaw and griſt-mills.—Alſo, a townſhip in Herkemer county, New York, taken from German Flats, incorporated in 1796, and containing 1976 inhabitants. Morſe.

LIT-CHI, or Lichi, in *Botany,* Sonnerat Voy. v. 2. 230. t. 129, a valuable Chineſe fruit, which, after being dried in an oven, becomes an object of commerce. It is globoſe, the ſize of a ſmall walnut, conſiſting of a thick tuberculated coat, encloſing a large hard ſeed, enveloped in a quantity of pleaſantly acid pulp. See Euphoria, Scytalia, and Dimocarpus.

LI-TCHUEN, in *Geography,* a town of Corea; 15 miles N.W. of Long-kouang.

LITE, the name of a plaſter much commended by the ancients: it conſiſted of verdigris, wax, and reſin. Whatever virtues this plaſter poſſeſſed, might be probably found in the melilot plaſter of the ſhops in general, till the late reformation made by the London Pharmacopeia, the colour being generally given by our wholeſale dealers with verdigris, not with the juice of the herb from which it took its name.

LITERÆ Communicatoriæ, in *Church Hiſtory*, letters granted by the biſhops to penitents, when the time of their penance was finiſhed, by which they were again received into the communion of the faithful.

LITERAL Algebra. See Algebra.

Literal *Character*. See Character.

Literalis *Calculus*. See Calculus.

LITERARY Property, is that property which an author, or his aſſignee, may be ſuppoſed to have in his own literary compoſitions; ſo that no other perſon without his leave may publiſh or make profit of the copies. The Roman law adjudged, that if one man wrote any thing on the paper or parchment of another, the writing ſhould belong to the owner of the blank materials (Juſt. 2. 1. 33.); meaning thereby the mechanical operation of writing, for which it directed, the ſcribe to receive a ſatisfaction; for, in works of genius and invention, as in painting on another man's canvas, the ſame law gave the canvas to the painter. As to any other property in the works of the underſtanding, the law is ſilent; though the ſale of literary copies, for the purpoſes of recital or multiplication, is certainly as ancient as the times of Terence (Prolog. in Eunuch. 20.), Martial (Epigr. i. 67. iv. 72. xiii. 3. xiv. 194.), and Statius (Juv. vii. 85.) Neither with us in England hath there been, till ſome few years ago, any final determination upon the right of authors at the common law. In caſe of a bargain for a ſingle impreſſion, or a ſale or gift of the copy-right, the reverſion is plainly continued in the original proprietor, or the whole property is transferred to another. It has been a queſtion much agitated in our ſuperior courts of judicature, and at length determined by the houſe of lords againſt authors and their aſſigns, whether the copy-right of a book belongs to the author by common law. But, excluſive of ſuch copy-right as may ſubſiſt by the rules of the common law, the ſtatute 8 Ann. cap. 19, amended by ſtatute 15 Geo. III. c. 53, has protected, by additional penalties, the property of authors and their aſſigns for the term of fourteen years, and hath directed, that if, at the end of that term the author himſelf be living, the right ſhall then return to him for another term of the ſame duration: and this is the ſole right now veſted in the proprietors of copies. By the ſtatute 15 Geo. III. c. 53, ſome additional privileges in this reſpect are granted to the univerſities, and certain other learned ſocieties. A ſimilar privilege is extended to the inventors of prints and engravings, for the term of twenty-eight years, by 8 Geo. II. cap. 13. and 7 Geo. III. cap. 38. beſides an action for damages, with double coſts, by ſtatute 17 Geo. III. c. 57. All which parliamentary protections appear to have been ſuggeſted by the exception in the ſtatute of monopolies, 21 Jac. I. c. 3, which allows a royal patent of privilege to be granted for fourteen years to any inventor of a new manufacture, for the ſole working or making of the ſame; by virtue whereof it is held, that a temporary property therein becomes veſted in the king's patentee. 1 Vern. 62.

Literary *Criticiſm*. See Criticism.

LITERATI, Letrados, lettered, an epithet given to ſuch perſons, among the Chineſe, as are able to read and write their language.

The literati alone are capable of being made mandarins.

The literati form the moſt diſtinguiſhed part of the Chineſe nation. Since the dynaſty of Han, *i. e.* for more than 2000 years, they have conſtantly held the chief rank in the empire; and it is always from among them that maſters are choſen for the education of youth; miniſters, for the adminiſtration of public affairs; and magiſtrates, for judging the people: in a word, the literati are, in ſome meaſure, the ſoul of the Chineſe nation; ſince it is from them that it receives its moral exiſtence, and its civil and political being. The literati muſt therefore be very numerous in a ſtate, where they enjoy every diſtinction attached to pre-eminence, and where every thing favours their increaſe. Since learning is the only means that conduct to honours, it is neceſſary that thoſe who aſpire to them ſhould cultivate letters; and they muſt make it appear, that they have cultivated them with ſucceſs, before they can obtain any civil employment. To guard againſt impoſition, government has fixed for every city of the firſt, ſecond, and third claſs the number of literati who can be legally promoted every year to the firſt degree of literature, which is that of "ſieou-tſai," and which anſwers to bachelor of arts in our univerſities. Every "ſieou-tſai" is accounted noble, and is never enrolled among the taxables. Of theſe there are reckoned to be in China 24,701 individuals, who are annually introduced to the firſt degree of literati; and the number of thoſe admitted before may be ſuppoſed to be at leaſt 20 times as great. According to this eſtimate there are always in China 494,020 literati, who have taken degrees, and who are, conſequently, not included among the taxables. See Mandarins.

Literati is alſo the name of a particular ſect, either in religion, philoſophy, or politics; conſiſting principally of the learned men of that country: among whom it is called *jukiao*, i. e. *learned*.

It had its riſe in the year of Chriſt 1400, when the emperor, to awaken the native affection of the people for knowledge, which had been quite baniſhed by the preceding civil wars among them, and to ſtir up emulation among the mandarins, choſe out forty-two of the ableſt among their doctors, to whom he gave a commiſſion to compoſe a body of doctrine, agreeable to that of the ancients, which was then become the rule, or ſtandard, of the learned. The delegates applied themſelves to the buſineſs with very great attention; but ſome fancied them rather to have wreſted the doctrine of the ancients, to make it conſiſt with their's, than to have built up their's on the model of the ancients.

They ſpeak of the Deity, as if it were no more than mere nature, or the natural power or virtue, that produces, diſpoſes, and preſerves the ſeveral parts of the univerſe. It is, ſay they, a pure, perfect principle, without beginning or end; it is the ſource of all things, the eſſence of every being, and that which determines it to be what it is. They make God the ſoul of the world: they ſay he is diffuſed throughout all matter, and produces all the changes that happen there. In ſhort, it is not eaſy to determine, whether they reſolve God into nature, or lift up nature into God; for they aſcribe to it many of thoſe things which we attribute to God.

This doctrine, in lieu of the idolatry that prevailed before, introduced a refined kind of atheiſm. The work, being compoſed by ſo many perſons of learning and parts, and approved by the emperor himſelf, was received with infinite applauſe by all the people. Many were pleaſed with it, becauſe it ſeemed to ſubvert all religion; others approved it, becauſe the little religion that is left them, could not give them much trouble. And thus was formed the ſect of the Literati; which conſiſts of the maintainers and adherents to this doctrine.

The court, the mandarins, and the perſons of fortune and quality, &c. are generally retainers to it; but a great part of the common people ſtill hold to their worſhip of idols.

The literati freely tolerate the Mahometans, becauſe they adore, with them, the king of heaven, and author of nature; but they bear a perfect averſion to all ſorts of idolaters among them: and it was once reſolved to extirpate them. But the diſorder this would have occaſioned in the empire prevented it: they now content themſelves with condemning them in general, as hereſies; which they do ſolemnly every year at Pekin.

LITERNUM, or Linternum, in *Ancient Geography*, a town of Italy, in Campania, at the mouth of the Clanis, and near the lake called by Statius "Linterna Palus." It was a Roman colony, improved and enlarged by Auguſtus. The ruins of it, conſiſting of ſome heaps of ſtones, may be traced on the edge of a large pond in a dreary flat ſhore, between the mouth of the Vulturnus and the promontory of Miſenum. Hither Scipio Africanus withdrew from the accuſations of his enemies, and here he ſpent his days in retirement. Tradition ſays, that his aſhes were depoſited in this place.

LITHAGOGI, of λιθος, *ſtone*, and αγω, *I bring away*, an epithet given by ſome medical writers to ſuch medicines as work by urine, and are ſuppoſed to have the virtue of expelling the ſtone.

LITHAGROSTIS, in *Botany*, from λιθος, *a ſtone*, and αγρωστις, *graſs*, a name faulty in itſelf, as compoſed of that of another eſtabliſhed genus, and quite unneceſſary. Gærtner contrived it for the *Coix* of Linnæus, Juſſieu, and others, becauſe the κοιξ of Theophraſtus ſeems to be a ſort of palm. But there is no end of ſuch critical alterations, eſpecially when they are not founded on any thing like certainty.

LITHANTHRAX, of λιθος, *ſtone*, and ανθραξ, *coal*, in *Natural Hiſtory*, is uſed as the name of the common pit coal. See Coal.

LITHARGE, compoſed of λιθος, *a ſtone*, and αργυρος, *ſilver*, a metalline ſubſtance, formed of the ſpume of lead; or, it is a calx of lead in an imperfect ſtate of vitrification. When ſilver is refined by cupellation with lead, this latter metal, which is purified, and which cauſes the ſcorification of the imperfect metals alloyed with the ſilver, is transformed into a matter compoſed of ſmall ſemi-tranſparent ſhining plates, reſembling mica, which is *litharge*. See *Alloys of* Lead.

This preparation of lead is of great uſe in roaſting the ſtubborn ores of gold, ſilver, and copper; for it melts all kinds of ſtones and earth into glaſs, ſooner than the metals; and by this means the metal, which is heavier, will fall through the glaſs, which is a thin and light ſubſtance, and will be collected under it into a regulus, with only a few duſty ſcoriæ adhering to it. But if it be copper that is thus ſeparated, a ſmall portion of it is always deſtroyed; and if gold or ſilver, a like ſmall portion is always lodged and detained in the ſcoriæ.

But as the litharge penetrates through all ſorts of veſſels, and while melting riſes into a ſcum, that often runs over their edges, the aſſayers never uſe it alone, but always mix with it ſuch ſubſtances as may give it a clamminefs, ſuch as flints, ſands, clay, or the like: they mix two parts of litharge with one part of any of theſe ſubſtances, and add ſome nitre, or common ſalt, that the whole may run the more eaſily. They ſhut up the veſſels, which muſt be made very thick and ſolid, with a ſmall cover or lid, cut cloſe, and placing this in a wind-furnace, they keep it in fuſion a quarter of an hour, looking at times into the aſh-hole, to ſee if the glaſs have not eſcaped through the veſſel, and run down thither. Very often it is found ſweating through the ſides of the veſſel, like water, and falling in drops into the aſh-hole; and in this caſe, there is no way to preſerve the remainder, but to take the veſſel out of the fire.

When the whole is cool, the veſſel muſt be broke, and at the bottom there will be found a ſmall quantity of a regulus of lead, revived by means of the ſalt; in the middle, the glaſs of lead, which muſt be kept for uſe; and at the top a ſaline cruſt, which is to be thrown away.

Litharge is more or leſs white or red, according to the metals with which the ſilver was alloyed. Accordingly the white is called litharge of ſilver, and the red has been improperly called litharge of gold.

Litharge may be eaſily revived into lead; accordingly, much of that which is produced by refining in great is reduced, by being melted upon burning coals. The part which is leaſt altered by mixture with other metals is thus reduced, and thus good and ſaleable lead is obtained. The reſt of the litharge of theſe refineries is ſold and uſed for various purpoſes.

The potters uſe much of it to give a beautiful gloſs to their wares; it is alſo employed in the compoſition of ſome glaſſes, for it is very fuſible, and aſſiſts the fuſion of other ſubſtances; and it is alſo uſed by painters, dyers, ſkinners, and glaziers. When mixed with wine, it gives it a bright ſprightly colour, but renders it extremely unwholeſome. In general, it has the ſame properties with the other calces of lead. The litharge commonly ſold is obtained from refineries, and the quantity thus procured is more than ſufficient for the demand. It is employed for the preparation of ſome plaſters and other external remedies. See Lead.

Litharge, *Plaſter of.* See Emplastrum *commune.*

Litharge, *Vinegar of.* See Vinegar *of Lead.*

LITHAY, or Litay, in *Geography*, a town of the duchy of Carniola, on the Save; 15 miles E. of Laybach. N. lat. 46° 3'. E. long. 15°.

LITHIASIS, (from λιθος, *a ſtone*,) in *Surgery*, the diſorder in which calculous concretions are formed in the urinary organs, and more eſpecially in the bladder, occaſioning a variety of ſymptoms dependent upon their ſhape, ſize, and ſituation. For further details upon this ſubject, ſee Lithotomy and Stone.

LITHIC, or Uric Acid. See Urinary *Calculus.*

LITHIDIA, a name which, in Hill's Hiſtory of Foſſils, is given to an aſſemblage of ſtones of the ſiliceous claſs, belonging to the quartz and flint tribes.

LITHOBOLIA, Λιθοβολια, in *Antiquity*, a feſtival celebrated by the Træzenians, in memory of Lamia and Auxeſia, two virgins, that coming from Crete to Træzene, in a time of tumult and ſedition, became a ſacrifice to the fury of the people, by whom they were ſtoned to death.

Lithobolia, or *Lapidation*, was alſo a common puniſhment inflicted by the primitive Greeks upon ſuch as were taken in adultery.

LITHOCOLLA, or Lithocollum, formed of the Greek λιθος, *ſtone*, and κολλα, *glue*, a cement uſed by the lapidaries to faſten their precious ſtones, in order for cutting them.

It is compoſed of reſin and brick-duſt. For diamonds, they uſe melted lead, putting them into it before it be quite cold: for other cements, they mix marble-duſt with ſtrong glue; and, to faſten their ſparks, add the white of an egg, and pitch. See Cæment.

LITHODÆMON, or Lapis *Dæmonum*, a name given by ſome authors to jet.

LITHODENDRON, a name by which, according to Dioſcorides, many of the ancients expreſs the common red coral.

LITHOGENESIA, a term uſed by ſome authors to expreſs the formation and original of ſtones.

LITHOLABON, a name given by ſome chirurgical writers to an inſtrument uſed in the operation of lithotomy; it is a forceps intended for taking hold of the ſtone.

LITHOLOGY, the ſyſtematical arrangement of ſtones; which ſee.

LITHOMANTIA, Λιθομαντεια, in *Antiquity*, a ſpecies of divination performed with ſtones. Sometimes the ſtone called *ſiderites* was uſed: this they waſhed in ſpring-water in the night by candle-light; the perſon that conſulted it, was to be purified from all manner of pollution, and to have his face covered: this done, he repeated divers prayers, and placed certain characters in an appointed order; and then the ſtone moved of itſelf, and in a ſoft, gentle murmur (or as ſome ſay) in a voice like that of a child, returned an anſwer. By a ſtone of this nature, Helena is reported to have foretold the deſtruction of Troy.

LITHOMARGE, *Steinmark*, Wern. *Argile lithomarge*, Haüy. *Steinmärg*, or *Sjoſkum*, Swed.

This ſubſtance, which is related to the ſmectic kinds of clay and to ſteatite, occurs friable and compact.

1. *Friable lithomarge. Zerreibliches ſteinmark*, Wern.

Its colour is ſnow-white, oftener yellowiſh, and ſometimes reddiſh-white.

It is found maſſive, diſſeminated, and in cruſts, conſiſting of fine, dull, ſometimes feebly glimmering ſcaly particles, which are either coherent or looſe.

It is light, rather greaſy to the touch, but adheres to the tongue. Streak ſhining.

It occurs in Saxony, on the Hartz, &c. generally in ſmall maſſes, particularly in metalliferous veins.

A variety from the Hartz, where it occurs in grey wacke, ſhews phoſphoreſcence by friction.

2. *Compact or indurated lithomarge. Feſtes ſteinmark*, Wern.

Its colours, beſides thoſe of the friable lithomarge, are pearl-grey, lavender and purpliſh-blue, yellowiſh-grey, ſeveral ſhades of ochre yellow, and alſo fleſh-red; ſeveral of theſe colours frequently occurring together as clouded, veined, ſtriped, and ſpotted delineations.

It is found maſſive.

Internally it is dull. Streak ſhining.

Fracture large and flat conchoidal, paſſing into even and fine earthy; fragments indeterminately angular, blunt-edged.

It is very ſoft and mild, and eaſily frangible; greaſy to the touch, but ſtrongly adhering to the tongue. It is light.

The variegated bluiſh and purpliſh earth, vulgarly called *Wunder-erde* in German, or *Terra miraculoſa Saxonica*, is one of the beſt known and fineſt variety of lithomarge. It is found at Planitz, near Zwickau, in Saxony, in beds of coal. A fine fleſh-red variety occurs at Rochlitz in Saxony, in diſintegrated porphyry. Lithomarge is alſo met with in ſeveral other parts of Saxony, and on the Hartz, in Bohemia, Moravia, Bavaria, and Siberia.

Compact lithomarge is partly found in veins, ſuch as tin ſtone veins, partly, as that of Planitz, on beds of coal; alſo (the yellow variety) in the cryſtalline geodes of the Topaze rock, in baſalt and amygdaloid. At Zöblitz, in Saxony, it occurs in ſerpentine.

This ſubſtance, of which we are ſtill without a good chemical analyſis, appears to paſs into ſteatite, meer-ſchaum, and alſo into variegated clay.

It has been frequently confounded by authors with porcelain earth, fullers' earth, bole, &c.

The variety of lithomarge occurring in ſerpentine, is uſed for poliſhing this latter ſtone. It was alſo formerly employed in medicine, particularly the variegated variety, which was dignified with the appellation of *terra miraculoſa*.

LITHONTRIPTICON Tulpii, the name of a famous diuretic medicine, invented by Tulpius, and given with great ſucceſs in caſes of the ſtone, but requiring great judgment and caution in the adminiſtering of it.

The preparation is this: take a drachm of cantharides without their wings, and a drachm of leſſer cardamoms without their huſks, powder them fine, and pour upon them an ounce of rectified ſpirit of wine, and half an ounce of ſpirit of nitre; ſet them to infuſe, without heat, for five or ſix days, ſtirring them from time to time. The phial muſt not be ſtopped cloſe; becauſe, if it be, the continual fermentation will burſt it. The doſe is from fourteen to fifteen, or twenty drops, in a glaſs of wine and water. It is to be taken in a morning, an hour after eating a meſs of broth, and may be repeated for three or four days.

It is remarkable, that this mixture never ceaſes fermenting for many years; but if it be too faſt corked, will break the glaſs; if it be ſlightly ſtopped, it only throws out the cork with an exploſion. Mem. de l'Acad. Par. 1709. p. 358. edit. Par.

LITHONTRIPTICS, or as it is perhaps more correctly written, Lithonthryptics, in *Medicine*, from the Greek λιθος, a *ſtone*, and θρυπτω, *I break*, ſuch medicines as were ſuppoſed to poſſeſs the property of diſſolving the ſtone in the bladder and kidneys. See Stone.

Various ſimple and compound drugs were believed to be capable of diſſolving the calculous concretions of the urinary paſſages, in ancient times. Theſe medicines, however, had been but too generally found, by modern practitioners, to be deſtitute of any active power of this ſort, when, in the former part of the laſt century, a new ſolvent for the ſtone was announced by a lady, with ſo much evidence in favour of its efficacy, that the Engliſh parliament granted her a large pecuniary reward for divulging the ſecret, and medical practitioners reſorted to it with eagerneſs, and inveſtigated its properties with great care, and in many inſtances had the ſatisfaction to obſerve a temporary removal of the diſtreſſing ſymptoms ſucceed to its uſe. It appeared, however, ultimately, that the ſolvent power of Mrs. Stephens's medicine was a gratuitous ſuppoſition; for on examining, after death, the bodies of the perſons in thoſe very inſtances, on the ſucceſs of which the reward was given, it was diſcovered that the ſtones had all the time remained in the bladders of the patients, though they were ſuppoſed to have been voided by the gradual ſolution of them effected by the medicines.

The principal inſtance of a ſuppoſed cure which was brought forward, was that of Mr. Gardiner. This man was examined in December 1748, by able ſurgeons, and found to have a ſtone in his bladder; after this he took Mrs. Stephens's medicines for eight months without intermiſſion; and at the end of that time he declared himſelf free from all his uſual complaints; and on ſearching him no ſtone was perceived in the bladder. Mr. Gardiner died about three years afterwards, and his body was opened. When the bladder was examined, there were found in it ſix preternatural apertures of different ſizes, the largeſt of which was capable of admitting the end of a finger. Theſe paſſages led to morbidly formed ſacs in the internal coat of the bladder, which ſhielded the calculi from the touch of the ſurgeon's ſounding ſtaff. In a word, though the ſubject was taken up by Dr. Hartley and others, and the medicine believed by ſome to poſſeſs all the powers which had been aſcribed to it; it was not only found, in ſeveral inſtances, that the calculi ſtill remained in the bladder after death; but the diſtreſſing ſymptoms were found to recur, or even to reſiſt the influence of the medicine, in a great many others.

Mrs. Stephens's medicine conſiſted principally of *ſoap*, and *lime*, prepared from ſhells; *i. e.* of lime, a fixed alkali, and a little oil. From theoretical notions, the celebrated Dr. Mead pronounced that a medicine containing ſuch cauſtic materials as *lime*, muſt injure the bladder by its corroſive powers, and therefore condemned the internal adminiſtration of it. Yet he did not know whether the lime could actually reach the bladder through the medium of the circulation with its cauſtic powers unchanged; a circumſtance which the inveſtigations of modern chemiſtry render improbable. And as for the ſubſtitute, ſoap-lees, which had been propoſed for the lime, he thought it ſcarcely leſs ſafe than the former. Dr. Whytt, of Edinburgh, after conſidering the inconveniences of this celebrated ſpecific, reſolved to omit the ſoap, and to try what virtues lime-water might have in diſſolving calculus; and he made many experiments on the qualities of the varieties of lime-water, made with the lime from lime-ſtone, and that from oyſter ſhells, upon fragments of urinary calculi immerſed in it. He concluded by recommending the copious potation of lime-water from ſhells, and adduced ſeveral inſtances of the beneficial effects of this remedy.

Now the truth appears to be, according to the reſult of more accurate obſervation, that all the alkaline and abſorbent medicines, potaſh, ſoda, lime, magneſia, &c. and eſpecially the alkalies, are capable of affording very material relief to the diſtreſſing feelings, connected with the preſence of calculi in the urinary paſſages; that they operate as preventives of a farther increaſe of the bulk and quantity of theſe concretions; but that they do not reach the urinary organs (after having paſſed the organs of the digeſtion, been taken up by the lacteals, and mixed and circulated with the blood) unchanged in their chemical qualities, or in a ſufficient quantity to produce any diminution of the calculi already exiſting there.

They ſeem to poſſeſs this preventive power, however, by their operation in the firſt paſſages. It is now known, that the ordinary calculus of the bladder and kidnies conſiſts of a peculiar animal *acid*, which has been called the *uric* or *lithic* acid, from its abundant exiſtence in the urine and its calculi. Now, although this acid is not formed in the chyle, or any of the fluids in the firſt paſſages; yet its rudiments appear to exiſt there; and experience has determined, that whatever diminiſhes the formation of acidity in the organs of digeſtion, diminiſhes alſo the quantity of the *uric* acid which ſhews itſelf in the urine, and *vice verſâ*. But it is the peculiar property of the alkalies and abſorbent earths, to neutralize acidity of every deſcription; and the alkalies are poſſeſſed of this property in a greater degree than the earths. Whence we may readily perceive how the uſe of theſe medicines, by neutralizing the acids, which are produced by a morbid or imperfect digeſtion of the food, and preventing the formation of that matter, which concretes in the urine into calculi, ſhould give material relief to the patient. It is not, however, very eaſy to underſtand how the prevention of this formation ſhould give ſo much relief, while the original concretion remains in the bladder, undiminiſhed in weight and ſize. Whether its ſurface becomes more uniformly ſmooth and leſs irritating, therefore, to the internal coat of the bladder, under the uſe of theſe medicines, it would be very difficult to aſcertain, ſince we have no opportunity of comparing its previous condition.

It is farther to be obſerved, however, that there is one variety of calculus found in the urinary paſſages, for which the alkalies and abſorbents are incapable of affording any relief; as, from its chemical compoſition, it is altogether inſoluble in theſe ſubſtances, even when directly immerſed in them. It is a triple ſalt formed by combination with the phoſphoric acid, and is, therefore, only to be diſſolved or decompoſed by an agent of a directly oppoſite quality to that of the alkalies; namely, by a mineral acid, which unites with the earthy and alkaline baſe. See NEPHRALGIA and STONE.

Dr. Hartley has publiſhed, in the London Gazette, the following receipt for making a lithontriptic electuary. Take five pounds of Alicant ſoap, ſhaved, and one pound of oyſter-ſhell-lime: put them into a tin veſſel, and pour upon them five quarts of water; make the water boil, till the ſoap be perfectly diſſolved in it, and then ſtrain all into a glazed earthen veſſel. Expoſe the maſs to the air, ſtirring it every day till it becomes both mild to the taſte, and of a proper conſiſtence to be formed into pills, or long pellets, without ſticking to the fingers. This may be expected to happen in two or three months. If it becomes ſufficiently mild before it has acquired a due conſiſtence, it may be brought to this, by being heated over the fire, in a tin veſſel: if it acquires a too hard conſiſtence, before it is ſufficiently mild, it muſt be ſoftened with water. This is what the doctor calls the lithontriptic maſs or electuary; which he orders to be made in a tin veſſel, becauſe a braſs or copper one would make it emetic.

He gives another more expeditious way of making it, which is this; pour two gallons of water upon a pound of oyſter-ſhell-lime; ſtir it two or three times, and when it has fallen to the bottom, pour off the clear part of the water. Repeat this fifteen or twenty times, or till the clear water, which is poured off, be almoſt taſteleſs; leaving about five pints of water upon the lime, after the laſt ablution. Then pour this mixture of water and dulcified lime upon five pounds of Alicant ſoap, ſhaved; and proceed as directed in the firſt receipt. The maſs, prepared in this manner, will be fit for uſe in a few days, or even immediately; but then the doctor prefers the foregoing receipt, where time can be allowed for it.

If the maſs of ſoap, and oyſter-ſhell-lime, dulcified in either of the above-mentioned ways, be made of the conſiſtence of an electuary, it is then called the lithontriptic electuary; which for cure is more convenient than the maſs, for thoſe who deſire to take the medicine diſſolved in a liquid vehicle, as milk, water ſweetened with honey or ſugar, water flavoured with brandy or rum, and ſmall beer.

Where a perſon is ſuppoſed to have a large ſtone in the kidnies or bladder, he ought to take every day as much of the maſs or electuary as contains two ounces of the ſoap, unleſs his pain and provocation to make water be violent; in which caſe it will be proper to begin with about half this quantity, and to increaſe it as he can bear. The medicine ought alſo in this caſe to be dulcified in an extraordinary degree.

By this medicine, the doctor thinks the generation of gravel, and gravel-ſtones, may be entirely prevented. See STONE.

It is likewiſe recommended in diſorders of the ſtomach and bowels, ariſing from, or attended with, acidities there; and in gouty habits. The patient may, in many of theſe caſes, begin with ſuch a quantity every day as contains an ounce of ſoap, and afterwards increaſe or leſſen this quantity, as he finds occaſion.

LITHOPHAGI, of λιθος, *ſtone*, and φαγω, *to eat*, a name given to thoſe who are capable of eating and digeſting ſtones; inſtances of which are given by Boyle, Exp. Phil. p. ii.

eſſ. iii. p. 86. Bulwer, Artificial Changeling, p. 307. and Paulian, Dict. Phyſique, art. *Digeſtion.*

LITHOPHAGUS, or STONE-EATER, in *Natural Hiſtory.* Under this name Deſbois deſcribes a ſmall worm, which deſtroys and feeds upon ſtones. It is covered by a ſmall, very tender, and brittle ſhell, of aſh-grey and greeniſh colour. This ſhell is pierced at both extremities: the worm evacuates its excrements through one of the apertures, while the other ſerves for an outlet to the head and legs. The animal itſelf is blackiſh; its body is compoſed of rings with ſix feet, three at each ſide; each foot with two joints. Traces of this worm are, according to the ſame author, ſometimes ſeen in the layers of ſchiſtus. Its progreſſive motion is effected by its head, with which it works its way, while the remainder of its body reſts on its feet. It has four jaws, which ſerve the purpoſes of teeth; and from its mouth iſſues a thread, of which it conſtructs its ſhell. It is furniſhed with ten ſmall black eyes, five on each ſide, and diſpoſed in a curved line like a creſcent. This worm undergoes a metamorphoſis in its ſhell, but it is not yet known what new form it adopts. Deſbois adds, that more than forty worms have been ſeen to iſſue from out the chryſalis: their heads were black, the feet very diſtinct, and the body partly of a yellow and partly of a red colour. Latreille conjectures this to be the larva of an inſect belonging to the tinea tribe.

LITHOPHILA, in *Botany*, ſo called by Dr. Swartz, being derived from λιθου φιλο, *a lover of rocks*, or *ſtones*, for it is an inhabitant of barren, ſtony places. Swartz. Prod. 14. Ind. Occ. v. 1. 47. Schreb. 784. Willd. Sp. Pl. v. 1. 154. Mart. Mill. Dict. v. 3.—Claſs and order, *Diandria Monogynia.* Nat. Ord. *Caryophyllei*, Linn. *Caryophylleis affine*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of three lanceolate, acute leaves. *Cor.* Petals three, ovate-lanceolate, erect, meeting together, the length of the calyx-leaves. Nectary of two oppoſite leaves, ſmaller than the corolla, carinated, acute, erect, compreſſed. *Stam.* Filaments two, awl-ſhaped, erect, from the baſe of the germen, as long as the nectary; anthers roundiſh. *Piſt.* Germen ſuperior, roundiſh; ſtyle erect, equal in length to the ſtamens; ſtigma obtuſe, emarginate. *Peric.* two-celled? *Seeds* unknown.

Eſſ. Ch. Calyx of three leaves. Corolla of three petals. Nectary of two leaves.

1. L. *muſcoides.** Swartz. Ind. Occ. v. 1. 48. t. 1.—A native of rocks in the deſert iſland of Navaza, in the Weſtern ocean.—*Root* very firmly attached to the rocks. *Stems* numerous, branched, very ſhort, thickiſh. *Branches* ſet with withered, whitiſh ſcales. *Leaves* ſmall, almoſt ſeſſile, narrower and embracing the ſtem at their baſe, linear, obtuſe, channelled, ſpreading. *Flowers* crowded together, whitiſh, on axillary and terminal ſtalks; each flower the ſize of a ſmall pin's head. The whole plant is extremely minute, ſcarcely half an inch high, and the parts of fructification are ſo ſmall as to require a magnifying glaſs for examination. This is the only ſpecies known.

LITHOPHOSPHORUS, the ſtony ſubſtances deſcribed under this name, in the works of ancient mineralogiſts, belong partly to a variety of ſulphate of barytes (Bononian ſtone), partly to ſome varieties of fluor ſpar; the name being derived from the property they poſſeſs of giving out light when ſcratched, or thrown on burning coals.

LITHOPHYTA, in the Linnean ſyſtem of *Natural Hiſtory*, the fourth order of vermes or worms; being compoſite animals, affixed to, and fabricating a fixed calcareous baſe, called coral: this order contains 59 ſpecies under four genera; *viz.* the *tubipora*, or red tubular coral, *madrepora*, or brain-ſtones, *millepora*, and *cellipora*. See GORGONIA.

One of the moſt remarkable ſpecies of the ſmall lithophyta we have any where an account of, is that deſcribed by Mr. Lewenhoeck, though without any particular name, in the Philoſophical Tranſactions, N° 286. p. 1430.

LITHOPTERIS, STONE-FERN, in *Natural Hiſtory*, a name given by Mr. Lhuyd to ſome of the foſſile plants of the fern kind.

LITHOSPERMUM, in *Botany*, from λιθος, *a ſtone*, and σπερμα, *the ſeed*, alluding to the marble-like hardneſs and poliſh of that part. Linn. Gen. 74. Schreb. 99. Willd. Sp. Pl. v. 1. 751. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 213. Ait. Hort. Kew. ed 2. v. 1. 286. Juſſ. 130. Tourn. t. 55. Lamarck Illuſtr. t. 91. Gærtn. t. 67.—Claſs and order, *Pentandria Monogynia.* Nat. Ord. *Aſperifoliæ*, Linn. *Borragineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, oblong, erect, in five deep, awl-ſhaped, acute, keeled, permanent ſegments. *Cor.* of one petal, funnel-ſhaped, as long as the calyx; tube cylindrical; limb obtuſe, erect, cloven half way down into five ſegments; throat pervious. *Stam.* Filaments five, very ſhort; anthers oblong, in the mouth of the corolla. *Piſt.* Germens four; ſtyle central between them, thread-ſhaped, the length of the tube; ſtigma obtuſe, cloven. *Peric.* none, except the calyx become ſpreading, and lodging the ſeeds, which it exceeds in length, in its cavity. *Seeds* four, ovate, pointed, hard and ſmooth.

Obſ. L. *diſpermum* has an inflated calyx, and but two ſeeds, each, as in the others, of a ſingle cell.

Eſſ. Ch. Corolla funnel-ſhaped, its mouth pervious and naked. Calyx in five deep ſegments.

The genera of the order of *Aſperifoliæ* have been thought by ſome to have been diſtinguiſhed with too great minuteneſs by Linnæus. The character of the preſent chiefly differs from *Pulmonaria* in the deep diviſions of its calyx; which part, nevertheleſs, in ſome ſpecies of the latter, is very nearly as much divided. Willdenow has ſixteen ſpecies of *Lithoſpermum*, of which three are Britiſh, *officinale*, *arvenſe*, and *purpuro-cæruleum.* The *flowers* are generally blue or whitiſh, rarely yellow; the *habit* herbaceous, rarely in ſome degree ſhrubby, very hairy or briſtly; *root* often annual; *leaves* ſimple, undivided, entire, alternate, almoſt univerſally ſeſſile. The following examples may ſuffice.

L. *officinale.* Common Gromwell, Grey Mill, or Grey Millet. Linn. Sp. Pl. 189. Engl. Bot. t. 134.—Seeds even. Corolla ſcarce longer than the calyx. Leaves lanceolate, veiny, rather acute.—Native of waſte ground, where the ſoil is dry, gravelly, or chalky, in various parts of Europe, being perennial, and flowering in May. The whole *herb* is of a dull duſky green, hairy, about two feet high; the *leaves* paler beneath, the ſhort and copious hairs of their upper ſurface each ſpringing from a minute white poliſhed tubercle. *Flowers* ſmall, pale buff-coloured, in leafy ſpikes, which are at firſt recurved, then erect. The *ſeeds*, two of which only are uſually perfected in each calyx, are remarkable for their poliſhed pearly whiteneſs, though ſometimes tinged with brown. Their ſtony hardneſs has given occaſion to a report of their effervescing with vinegar, as if really calcareous, but this appears to be without foundation; as well as their ſuppoſed utility in calculous complaints, which ſeems to have ariſen from the ſame circumſtance; juſt as ſpotted or bliſtery vegetables were preſumed good for the lungs.

L. *arvenſe.* Corn Gromwell, or Baſtard Alkanet. Linn. Sp. Pl. 190. Engl. Bot. t. 123. Fl. Dan. t. 456.—

Seeds rugged. Corolla ſcarce longer than the calyx. Leaves obtuſe, without lateral veins.—Native of fields and waſte places, in a dry ſandy ſoil, throughout Europe. The *root* is annual, its bark affording a fine red ſtain, like Alkanet, with which the country girls, in the north of Sweden, are accuſed by Linnæus of ſtaining their cheeks. The *ſtem* is buſhy, ſpreading, hardly a foot high. *Corolla* white. *Seeds* brown, rugoſe.

L. *purpuro-cæruleum*. Creeping Purple Gromwell. Linn. Sp. Pl. 190. Engl. Bot. t. 117. Jacq. Auſtr. t. 14.—Seeds even. Corolla much longer than the calyx. Leaves lanceolate, acute, without lateral veins.—Native of buſhy waſte ground, in the more temperate climes of Europe, eſpecially where the ſoil is calcareous, flowering in May. With us it is eſteemed a rare plant. The *root* is perennial, black and creeping. *Stems* herbaceous, ſcarcely branched, while barren procumbent and rooting, otherwiſe erect, round, leafy, about a foot high, terminating in a forked leafy cluſter, of ſeveral handſome purple *flowers*, with a pale reddiſh tube. The *ſeeds* are often abortive. There are five blunt hairy ſwellings round the orifice of the tube, which, though they do not cloſe that part, render the generic character ſomewhat ambiguous. Such however are found in all the Britiſh ſpecies, and in ſome, though not all, of the exotic ones.

L. *fruticoſum*. Shrubby Gromwell. Linn. Sp. Pl. 190. (Anchuſa lignoſior monſpelienſium, flore violaceo; Barrel. Ic. t. 1168.)—Stem ſhrubby, erect. Leaves linear, hiſpid. Segments of the corolla ſlightly pointed; tube hairy.—This beautiful plant occurs on rocky expoſed hills and cliffs in the ſouth of France, Italy, and the Levant. Its ſhrubby buſhy *ſtem*, and copious roſemary-like leaves, diſtinguiſh the ſpecies. The *flowers* are of a moſt vivid blue.

L. *hiſpidulum*. Briſtly Woody Gromwell. Sm. Prodr. Fl. Græc. Sibth. v. 1. 114. Fl. Græc. ined. t. 162.—Stem ſhrubby, diffuſe. Leaves elliptic-oblong, obtuſe, hiſpid. Branches hoary.—Gathered by the late Profeſſor Sibthorp, on rocks in the iſle of Rhodes. Its *flowers* are nearly as beautiful as the laſt, but their ſegments are more rounded, and the throat more inflated, that part being, in both theſe, deſtitute of any marginal ſwellings or appendages. The preſent is not mentioned by Willdenow.

L. *orientale*. Yellow Perennial Gromwell. Linn. Syſt. Veg. ed. 14. 185. Willd. n. 9. Curt. Mag. t. 515. (Anchuſa orientalis; Linn. Sp. Pl. 191.)—Seeds rough with ſharp points. Spikes long, leafy. Leaves oblong, wavy.—Native of the Levant; hardy and perennial in our gardens, flowering in May and June, and diſtinguiſhed by its full-yellow *corolla*, whoſe ſegments are rounded, and orifice without ſwellings. The floral *leaves* are ſometimes heart-ſhaped, ſometimes ovate or lanceolate; thoſe of the ſtem oblong or lanceolate, wavy at the edges; all hairy.

Several peculiarly briſtly ſpecies of this genus were found and deſcribed by Forſkäll, which have been adopted by Vahl and Willdenow.

LITHOSPERMUM *Officinale*, ſeu *Milium Solis*, *Common Gromwell*, in the *Materia Medica*, is found in various parts of England, on a dry gravelly ſoil, and flowers in May and June. According to Haller, this plant poſſeſſes narcotic powers; but its ſeeds only have been medicinally employed. Theſe ſeeds have long excited the attention of naturaliſts, on account of their exquiſitely poliſhed ſurface, and ſtony hardneſs. The internal ſubſtance is ſofter, and ſeems to conſiſt of a farinaceous, ſweet, and oily matter, which becomes rancid on being long kept. The ſtony appearance of theſe ſeeds formerly ſuggeſted their efficacy in calculous and gravelly diſorders, to perſons whoſe judgment was influenced by ſuperſtitious and abſurd conceits. But though modern writers do not allow the lithontriptic character of the ſem. milii ſolis, yet they generally aſcribe to them a diuretic quality, a power of cleanſing the urinary paſſages, and of obviating ſtrangury, eſpecially when employed in the form of an emulſion; but Woodville obſerves, that the free uſe of any bland diluent would probably anſwer theſe purpoſes equally well. The abſorbent virtue aſcribed to theſe ſeeds is wholly groundleſs, being irreconcileable to the principles of chemiſtry. Woodv. Med. Bot.

LITHOSTROTA, among the *Ancients*, pavements made up of ſmall pieces of cut marble of different kinds and colour. See TESSELATED.

LITHOSTROTION, in *Natural Hiſtory*, the name of a ſpecies of foſſile coral, compoſed of a great number of long and ſlender columns, ſometimes round, ſometimes angular, jointed nicely to one another, and of a ſtarry or radiated ſurface at their tops. Theſe are found in conſiderable quantities in the northern and weſtern parts of this kingdom, ſometimes in ſingle, ſometimes in complex ſpecimens.

LITHOTOME, from λιθος and τεμνω, a name that has been given to a variety of cutting inſtruments, which have been employed for making an opening into the bladder, in order to extract the ſtone. The moſt celebrated of all is the lithotome caché of Frère Côme, of whoſe inſtrument and methods of operating we ſhall have to ſpeak in the following article.

LITHOTOMY, from λιθος, *a ſtone*, and τεμνω, *to cut*, ſignifies, in *Surgery*, the operation by which a ſtone is extracted from the bladder.

Surgical writers inform us, that urinary calculi admit of being extracted from three different ſituations, *viz.* from the kidney, the urethra, and the bladder. The queſtion, whether a ſtone ought ever to be cut out of the kidney, will have due conſideration given to it under the head NEPHROTOMY; and the removal of calculi from the urethra will be treated of in the article URETHRA. Our preſent obſervations will be confined to the ſtone in the bladder, a ſubject of infinite importance, whether we contemplate the ſeverity or frequency of the affliction; its incurableneſs by medicines, or the perils and difficulties of the operation for its relief; the numerous modes of cutting for the ſtone, or the nice judgment requiſite not only in the choice of a method, but alſo in the ſelection of inſtruments; the anatomical knowledge which the operator ought to poſſeſs; or, finally, that happy, though rare, combination of gentleneſs, dexterity, and reſolution, ſo eſſential in conſtituting a diſtinguiſhed and ſucceſsful lithotomiſt. We have heard of a Pott, who would finiſh the operation by four or five movements, and fill every ſpectator with admiration of his ſuperior ſkill. True ſkill, however, rather conſiſts in doing a thing as ſafely as poſſible, than with the utmoſt quickneſs. Now, if it be certain that lithotomy is more likely to be followed by the patient's recovery, when no manual roughneſs is exerciſed, rapid operating muſt be condemned by the judicious and diſcerning, however calculated it may be to excite the applauſe and admiration of the inexperienced ſtudent. Pott, we are informed, was remarkably ſucceſsful in his operations for the ſtone: but, it muſt be aſked, did he not loſe ſome of his patients? If he did,—great as his ſucceſs might be, we are juſtified in thinking that it would have been ſtill greater, had it been his cuſtom to aim at gentleneſs more than expedition. The example of Pott, therefore, is not to be imitated in this reſpect; and that he even acted in oppoſition to his own principles is fully proved by the following paſſage: "I cannot omit this opportunity of adding a few words on a ſubject, which appears to me highly deſerving of ſome notice, as its influence may be very extenſive, and very prejudicial: it is the falſe idea which the by-ſtanders at an operation generally have of chirurgic *dexterity;* to which word they annex no other idea than that of quickneſs. This has produced a moſt abſurd cuſtom of meaſuring the motion of a ſurgeon's hand, as jockeys do that of the feet of a horſe, *viz.* by a ſtop-watch; a practice which, though it may have been encouraged by operators themſelves, muſt have been productive of moſt miſchievous conſequences. *Tuté et celeriter* are both very proper characteriſtics of a good chirurgic operation: but *tuté* ſtands, as it ſhould do, in the firſt place; as the patient, who ſuffers the ſmalleſt injury from the hurry of his operator, has no recompence from the reputation which the latter obtains from the by-ſtanders. In moſt of the capital operations, unforeſeen circumſtances will ſometimes occur, and muſt be attended to; and he who, without giving unneceſſary pain from delay, finiſhes what he has to do in the moſt perfect manner, and the moſt likely to conduce to his patient's ſafety, is the beſt operator." (Pref. to Obſ. on Fiſt. Lachrymalis.) We ſhould not have premiſed theſe remarks, had we not often ſeen ſurgeons guilty of unwarrantable hurry and roughneſs in the performance of lithotomy; and did we not believe that the inflammation of the bladder and peritoneum, of which patients uſually die after the operation, may, in numerous inſtances, be imputed to ſuch a cauſe.

The ſtones, which are met with in the human bladder, are not all originally formed in this viſcus: many deſcend through the ureters from the kidnies; but yet it is not to be denied, that moſt of them are firſt produced in the bladder itſelf, by a ſpontaneous concretion of particular ſalts contained in the urine. It may be inquired, Is the exiſtence of a centre, round which the calculous materials are depoſited and arranged, abſolutely neceſſary to the formation of ſuch concretions? It is well known, that whenever an extraneous ſubſtance lodges in the bladder, it becomes the nucleus of a ſtone; but, on the other hand, the centre of many calculi preſents no particular appearance, nor any mark from which we can infer that they had any central ſubſtance, upon which they increaſed to their preſent ſize. Poſſibly, ſays Richerand, a clot of blood, or a piece of thickened mucus, may ſerve as their baſe, and yet, after a time, diſappear. However this may be, urinary calculi offer numerous differences in reſpect to their ſize, ſhape, number, denſity, compoſition, and the manner of their being contained in the bladder. Noſogr. Chir. tom. iii.

In ſome caſes, the bladder only contains one ſtone; in others, it includes ſeveral. In this laſt circumſtance, the calculi are always ſmaller; their diminiſhed ſize being in proportion to the greatneſs of their number. It has been eſtimated that, on the average, about three-fourths of calculous patients have only one ſtone in their bladder. Our own individual experience would make the proportion much higher, perhaps five or ſix out of every ſeven. Sometimes the bladder contains two calculi; but a larger number may occur from three to ſixty, or more. Their ſize varies from that of a bean to that of a cocoa nut. The muſeums of the Ecole de Médecine at Paris, and that of profeſſor Fourcroy, exhibit ſpecimens of calculi, which filled the whole cavity of the bladder. In the Philoſophical Tranſactions for 1809, ſir James Earle has deſcribed an enormous ſtone, which could not be extracted from the bladder; the attempt having been made in vain by Mr. Cline. Indeed the calculus filled almoſt the whole of the pelvis, and could not be taken out of the dead ſubject without conſiderable difficulty. The weight of this immenſe ſtone was forty-four ounces; its form elliptical, with a long axis of ſixteen, and a ſhorter one of fourteen inches. This, however, was an extraordinary caſe; and the average ſize of calculi, met with in the bladder, is from the bulk of a pigeon's to that of a hen's egg.

The varieties of ſhape are innumerable: moſt of the ſtones, however, which are found in the bladder, are oval, and more or leſs flattened. Their ſurface is ſometimes ſmooth and rounded; very often it is irregular and rough. Stones, ſtudded with aſperities, are frequently termed *mulberry calculi,* and that theſe muſt produce conſiderable irritation of the bladder, and a vaſt deal of pain, is a fact which requires no comment. We ſaw a ſtone extracted a few weeks ago, the outer ſurface of which was quite ſmooth and of a light colour; but on breaking a portion of it away, the inner part of the calculus preſented a granulated and dark brown appearance. The generality of ſtones taken from the human bladder are hard and reſiſting; but ſome are exceedingly friable, giving way to the ſlighteſt preſſure, and breaking into ſmall pieces, or even into a ſort of gritty matter.

The chemical compoſition of urinary calculi is far from being always the ſame. The learned inveſtigations of Wollaſton, Pearſon, Fourcroy, and Vauquelin, have diſcovered, that the materials may conſiſt of uric acid, urate of ammonia, phoſphate of lime, ammoniaco-magneſian phoſphate, oxalate of lime, ſilex, and a peculiar modification of animal matter. The baſis of theſe concretions was aſcertained by Scheele to be the uric acid. Other ſpecies were afterwards detected. Dr. Wollaſton, whoſe diſſertation was publiſhed in the Philoſophical Tranſactions two years before the memoir of Fourcroy and Vauquelin was read to the French National Inſtitute, anticipated nearly every thing which the French chemiſts announced as their own diſcoveries; and it is very remarkable (as profeſſor Murray has noticed), that although the experiments of Pearſon, publiſhed in the Philoſophical Tranſactions the year after Wollaſton's, are referred to in that memoir, not the ſlighteſt mention is made of the diſcoveries of this latter gentleman! As our department is ſurgical, and not chemical, we ſhall quit this ſubject with briefly ſtating, that Dr. Wollaſton has arranged urinary calculi into four ſpecies. 1ſt. The uric acid concretion. 2dly. The fuſible calculus, or phoſphate of ammonia and magneſia. 3dly. The mulberry calculus, or oxalate and phoſphate of lime. 4thly. The bone earth calculus, or that compoſed of the phoſphate of lime.

It will be with regret, that we ſhall preſently have to ſtate the little practical advantage hitherto derived from the knowledge of the chemical compoſition of urinary calculi.

Theſe concretions are uſually quite free and unconnected, ſo that the particular ſituation, which they occupy in the cavity of the bladder, is ſubject to change, being determined entirely by their own weight, or the contractions of the organ containing them. In ſome inſtances, however, they are adherent to the parietes of the bladder, and continue fixed in one place. Such adheſion may happen in three manners. 1. The ſtone may have been formed in a cul-de-ſac appendage, conſiſting of a protruſion of the lining of the bladder between the fibres of its muſcular coat; or, after being originally lodged in the common cavity of the bladder, it may have been forced into a pouch of this kind by ſubſequent contractions of this viſcus. 2. The ſtone may be lodged in that portion of the ureter which runs obliquely between the coats of the bladder. 3. Laſtly, the irregular ſurface of a calculus may be, as it were, implanted in the fungous granulations, which occaſionally ariſe from the inſide of the bladder, and, in this circumſtance, the ſtone can only be extracted by tearing its connection.

The calculi, which lie in a ſort of cul-de-ſac protruſion of the lining of the bladder, are often named *encyſted.* We believe that a ſtone, thus circumſtanced, is not likely to cauſe ſevere pain; the containing pouch becomes habituated to its preſence; and the ſenſible inſide of the bladder is not expoſed to any irritation or injury from it. We conceive it poſſible for ſome of the alleged diſſolutions of ſtones to have been caſes, in which the extraneous body became thus protruded, between the faſciculi of muſcular fibres, into a cyſt formed of the inner membrane of the bladder. A ſtone encyſted in this manner would, in all probability, neither require extraction, nor admit of it.

Blundering and baffled operators are generally eager to lay hold of any excuſe for their miſconduct, or ill ſucceſs. The adheſion of the ſtone has been frequently employed as a defence againſt cenſure, when the attempts to extract the foreign body have failed. Encyſted calculi, generally, cannot be touched with a ſound, and both on this account, and becauſe the ſymptoms are far more lenient than thoſe of a ſtone in the bladder, ſuch caſes do not demand the performance of lithotomy. A ſtone in the lower part of the ureter could not be touched with the ſound, and would be attended with effects different from thoſe of a calculus in the cavity of the bladder. Now, theſe are the only examples where the extraction of the ſtone would be impracticable on the ground of adheſion, and they are certainly inſtances in which an intelligent ſurgeon would never begin the attempt. But we aſſert with confidence, that when a calculus is fairly lodged in the cavity of the bladder, no adheſion can be a juſt excuſe, or reaſon, for its not being extracted. We muſt be convinced, with that eminent ſurgeon Le Dran, that an animated body, which ſubſiſts by a circulation of fluids, and another body, which owes its bulk entirely to an appoſition of matter, can never become one and the ſame by any kind of adherence, let it be ever ſo ſtrong. Le Dran made no doubt, that there were ſuch things as adherent ſtones, becauſe he had ſeen inſtances of them, but theſe adheſions ought not to have hindered the ſtone from being extracted, provided it could be laid hold of with the forceps. In 1730, this ſurgeon cut a lady, and extracted a ſtone, that weighed ſeven ounces and a half. One ſide of it was uneven, and in a manner entirely incruſted upon that part of the bladder which is connected with the rectum. This incruſtation was occaſioned by the inequalities of the ſtone, which had produced an excoriation of that part of the bladder upon which they preſſed, and, in conſequence thereof, a number of fleſhy or fungous excreſcences aroſe from the excoriated ſurface, and had lodged themſelves in the cavities of the ſtone. The adheſion was broken with hardly any pain. Le Dran, at ſubſequent periods, extracted from three patients ſtones, which adhered in the ſame manner. In 1715, he was preſent at an operation, performed by M. Marechal, when a ſtone was extracted, which was ſhaped like a calabaſh, or gourd, and brought out with it a fungus, that encircled the ſtone at its narroweſt part. As this fungous excreſcence paſſed round, and covered the middle of the ſtone, no new ſtrata could be formed in that part, but were made at the two extremities, which was the reaſon of its being ſo ſhaped; and the fungus fixed it ſo completely in the bladder, that it could not poſſibly change its ſituation. Traité des Operations de Chirurgie.

Of all animals, man is ſaid to be the moſt ſubject to urinary calculi. The human urine contains a particular acid, ſo little ſoluble, and ſo diſpoſed to produce concretions, that, frequent as the diſorder is, it is rather a matter of ſurpriſe, that it is not even more common. In warm countries, like Spain and Africa, as well as in nations much to the north, ſuch as Sweden, the diſeaſe is exceedingly rare. In temperate climates, it prevails the moſt in cold damp countries, like England and Holland; and, according to Richerand, it occurs in ſome of the provinces of France much more than in others, patients with the ſtone being more numerous in the northern, than the ſouthern departments of that empire.

Children and old people are more frequently afflicted than adults, and women are leſs expoſed to the diſorder than men.

Symptoms of a ſtone in the bladder.—A ſtone in the bladder occaſions pain, and derangement of the excretion of the urine; and when a ſuſpicion of the diſeaſe is excited by theſe ambiguous ſymptoms, it can only be confirmed by introducing an inſtrument, called a ſound, into the bladder. The pain produced by the preſence of a calculus in the bladder, has the particularity of always affecting, in a very remarkable manner, the extremity of the penis. The glans becomes the ſeat of an itching ſenſation, which daily increaſes in violence; and patients, eſpecially children, often get into the habit of pulling forwards the prepuce, in order to obtain relief. Hence, this part is frequently elongated in an extraordinary degree. This ſympathetic ſort of pain is more acute the larger the ſtone is, and the greater the irregularity of its ſurface. When the bladder is full of urine, the pain is not inſupportable; but juſt at the period when the diſcharge of that fluid is finiſhed, the ſuffering becomes intolerable, becauſe, at this inſtant, the bladder contracts, and embraces the foreign body with conſiderable force. All rough exerciſes augment the pain; but walking over an uneven country, riding on horſeback, and the jolting of a carriage particularly, have ſuch an effect. When the patient is ſubjected to theſe exerciſes, he not unfrequently diſcharges a few drops of blood from the urethra.

The deſire to make water comes on very often, and the urine, as it flows, is attended with a ſenſation of heat, which changes into a burning kind of pain at the extremity of the penis. The ſtream of water is ſometimes interrupted all on a ſudden. The patient vainly endeavours to continue the evacuation; he applies his hand to the perineum; he moves about, lies down, or, in ſome way or another, alters his poſture, and the urine then begins to run again. The moveableneſs of the ſtone makes it every now and then fall againſt the orifice of the neck of the bladder, and thus prevent, for a time, the exit of the urine.

The inceſſant irritation, produced by the preſence of the calculus, extends to the rectum; the patient is continually teazed with an inclination to go to ſtool, and the efforts, which his imaginary want cauſes him to make, bring on, in many inſtances, hemorrhoidal complaints, or even a prolapſus ani.

In the courſe of time, the pain becomes more acute and unremitting. The ſtone increaſes in ſize, and, by continually preſſing upon the inferior part of the bladder, makes the patient experience a moſt painful ſenſe of weight about the rectum. The evacuation of the urine is attended with more and more difficulty. The parietes of the bladder inflame, and are rendered thicker; its inner ſurface ulcerates; the urine becomes blended with matter and blood; a ſlow ſort of fever occurs; and the patient, after lingering a great while in miſery and pain, falls a victim to the diſorder. On opening the body after death, the bladder is found contracted, and its coats thickened, indurated, and more injected with blood, than in the healthy ſtate.

The fatal termination, to which theſe caſes tend, when unrelieved, is ſubject to conſiderable variety. Some patients have been known to live with a ſtone in their bladder ten, twenty, and even thirty years, without the pain being ſo ſevere as to incline them to ſubmit to lithotomy. Richerand moreover aſſures us, that calculi, of very large ſize, and irregular ſurfaces, have ſometimes given riſe to no ſymptoms, by which their preſence could be ſuſpected. This author tells us, that, as he was once practiſing operations on the dead ſubject in the Hôpital de la Charité, he extracted an enormous mulberry calculus from the bladder of a patient who had died of ſome other diſeaſe, and who, while living, had betrayed no complaints, indicating that he was afflicted with the ſtone. This calculus, which was compoſed of the oxalate of lime, was exceedingly heavy, and by its weight, darkneſs of colour, and the manner in which its ſurface was ſtudded with obtuſe points, bore a great reſemblance to a ſcoria of iron. It is preſerved in Fourcroy's muſeum, where it was depoſited by Boyer.

The ſymptoms of a ſtone in the bladder are ſo fallacious and equivocal, that every prudent ſurgeon avoids delivering a poſitive opinion, before he has ſounded the patient. Certain complaints may make him ſuſpect the nature of the caſe; but he muſt never preſume to be certain, until he has actually touched and felt the ſtone, by means of a metallic inſtrument, paſſed through the urethra into the bladder. The general ſymptoms of a ſtone in the bladder are not peculiar to this diſorder; they belong to ſeveral other affections, for which the practitioner may be conſulted. An enlarged proſtate gland produces many effects, like thoſe of a ſtone in the bladder. There is this difference, however, riding in a carriage, or on horſeback, does not increaſe the grievances when the proſtate is affected; but it does ſo, in an intolerable degree, in caſes of ſtone. It alſo generally happens, that the fits of ſtone come on at intervals, whereas the pain from a diſeaſed proſtate is neither ſo unequal, nor ſo acute.

At this preſent time, (September 1811,) there is a man in St. Bartholomew's hoſpital who ſuffers many of the complaints uſually attending a ſtone in the bladder; he has been ſounded, but no calculus can be diſcovered: and it is now aſcertained that his ſymptoms are dependent upon a contraction ſituated ſome diſtance up the rectum. The ſtricture is ſo conſiderable, that the feces can only paſs in a liquid form, and the introduction of bougies above a ſmall ſize is quite obſtructed.

Who would ſuppoſe that ſymptoms, exactly ſimilar to thoſe of a ſtone in the bladder, could proceed from the venereal diſeaſe, and be cured by mercurial treatment? Yet, ſuch a fact have we recorded by Richerand, now an eminent ſurgeon at Paris. See Noſographie Chirurgicale, tom. iii. p. 506, edit. 2.

Nothing, therefore, except ſounding the patient, will give the ſurgeon certain information of the preſence of a calculus in the bladder. The ſymptoms which prevail may excite ſtrong ſuſpicions of the nature of the caſe; but ſince they may proceed from ſo many other different cauſes, they are not alone a ſufficient warrant for venturing on the performance of lithotomy. When the ſurgeon undertakes this important operation, he muſt know with certainty that there is a ſtone in the bladder, and ſuch poſitive knowledge can only be acquired by actually feeling and hearing the ſteel inſtrument, called a ſound, ſtrike againſt the foreign body. Nay, further, as the ſtone may be in the bladder to day, but be protruded to morrow on the outſide of the muſcular coat of this organ, ſo as to become as it were encyſted and incapable of extraction, "it is an invariable maxim among all prudent ſurgeons never to begin the operation of lithotomy unleſs they can clearly and diſtinctly perceive the ſtone with the ſound, or at leaſt with the ſtaff at the time when the patient is brought forth to be operated upon." If the calculus cannot be plainly felt at this period, the operation is not juſtifiable. The importance of this precept cannot be too highly appreciated by every practitioner who values either his patient's welfare or his own reputation; for were a different line of conduct purſued, an opening might be made into the bladder, no ſtone be found, and, unfortunately, the patient loſe his life from the operation, which, however well executed, is never free from a ſerious degree of danger.

The method of ſounding will be deſcribed in a future volume of this Cyclopædia. See SOUNDING.

The ſtone in the bladder is a diſorder that is to be regarded as more grievous the longer it has exiſted, and the older and more debilitated the patient is. The caſe is particularly afflicting when the ſevere pain in the kidnies renders it not unlikely that there may be at the ſame time other calculi in the ſubſtance of theſe organs.

A ſtone is ſeldom known to be in the bladder until it is too large to paſs out through the urethra. Should a very ſmall one be detected, we are recommended to try the effect of introducing a large ſound or bougie, making the patient drink abundantly of ſome diuretic liquor, and deſiring him firſt to retain his urine, and then expel it as forcibly as poſſible, at the ſame time that the ſound or bougie is withdrawn. In this manner, it is conceived, the ſtream of the urine might ſometimes carry the calculus outward. Deſault had it in contemplation to adapt the port-crayon pincers, invented for the urethra by Mr. Hunter, to a common catheter, for the purpoſe of taking ſmall calculi out of the bladder. This project, however, would be attended with much difficulty, and the ſides of the bladder would be liable to laceration in conſequence of becoming pinched. Inſtruments made on this principle, however, are ſometimes ſucceſsfully employed for taking ſmall ſtones out of the urethra.

Diſſolution of ſtones in the bladder.—The poſſibility of diſſolving ſtones in the bladder was a thing believed for a very long ſpace of time, and even at the preſent day is a ſcheme not altogether abandoned. The diſſolution has been attempted both by internal medicines, and by certain fluids injected into the bladder.

The knowledge of the compoſition of urinary calculi at once appriſes us that, as they conſiſt of very different materials in different caſes, the ſame ſolvent cannot be applicable to all of them.

It is obſerved by Murray, one of the learned profeſſors of chemiſtry at Edinburgh, that long experience has ſufficiently eſtabliſhed the advantage derived in calculous affections from the uſe of alkaline remedies; and as the calculi, compoſed of uric acid, are thoſe which appear to be moſt abundant, it is ſuppoſed to be from the chemical action they exert upon it that the benefit is derived. Where the pure alkali is uſed, a real ſolvent power may be exerted; and it has been proved that the alkali is ſecreted by the kidnies, ſo as to render the urine ſenſibly alkaline, and even capable of acting on the calculus out of the body. Yet the ſolvent power is very inconſiderable, and the remedy at the ſame time proves ſo irritating, when taken to any conſiderable extent, that the ſolution of a calculus, even of ſmall ſize, can perhaps be ſcarcely expected. The pain and irritation which attend the diſeaſe, however, are conſiderably alleviated by their habitual uſe, and this even when the alkali is ſaturated, or ſuper-ſaturated with carbonic acid, a circumſtance with regard to which there appears ſome difficulty in giving an explanation, ſince the alkalies in this ſtate have been ſuppoſed not to act on the uric acid. But, from the experiments of Dr. Egan (Philoſ. Magaz. vol. 23 and 24), this appears to be a miſtake; though the relief obtained from the uſe of theſe may alſo be in part derived from the ſaturation of the other acid, whether phoſphoric or acetic, which is likewiſe ſecreted; the urine is thus rendered leſs irritating, and the tendency to a depoſition of uric acid diminiſhed, all acids haſtening the precipitation of this acid from the urine. It has accordingly been found, that under the uſe of alkaline remedies, the ſediment of uric acid from the urine, ſo often abundant in caſes of calculus, rapidly diminiſhes. The increaſe of the concretion is thus prevented, and the principal cauſe of irritation removed.

So far, therefore, profeſſor Murray acknowledges that the alkalies may act as palliatives; but he contends, that it muſt be very doubtful if they can be given to ſuch an extent as to exert an actual ſolvent power. Beſides, there is an effect which may attend their continued uſe, eſpecially in large doſes. It has been remarked by Mr. Brande, that the phoſphates of lime and magneſia are held in ſolution in urine, chiefly by its exceſs of acid; if this be ſaturated, therefore, by the uſe of an alkali, although the depoſit of uric acid may be checked, that of the phoſphates will be favoured, and it appears that it is principally from a depoſition of theſe that a calculus in the bladder increaſes in ſize. Some caſes, adduced by Mr. Home, appear to ſupport this concluſion.

Lime, under the form of lime-water, has been employed as a ſolvent. The experiments of Dr. Egan have ſhewn, that lime-water acts with more energy than an alkaline ſolution of ſimilar ſtrength in deſtroying the aggregation of urinary concretions, and Murray found the ſame thing. The lime probably operates more upon the albumen or animal matter, which appears to ſerve as the cement or connecting ſubſtance, than upon the uric acid; and Murray thinks that in endeavouring to diſcover ſolvents for theſe concretions, our views ought perhaps rather to be directed to this operation than to the effect on the ſaline matter. If, ſays he, lime, when received into the ſtomach under the form of lime-water, can be ſecreted by the kidnies, as the alkalies unqueſtionably are, it would appear to be ſuperior to them as a ſolvent. But when we conſider the ſparing ſolubility of lime, and the ſmall quantity of it therefore that can be brought to the kidnies, the poſſibility of its ſecretion may be doubted. Mr. Brande has even ſuppoſed that, were it ſecreted, it would rather prove hurtful, by forming an inſoluble compound with the phoſphoric or carbonic acids, which are always contained in the urine. Murray owns this to be poſſible; but he argues that if the concretion of theſe ſubſtances into a calculus is owing principally to the action of the animal matter, ſince this muſt be prevented, any depoſit would be diſcharged, and perhaps the aggregation of an exiſting concretion be deſtroyed. Under this view, Murray thinks that the proper practice would be the exhibition of alkali and lime together, the former neutralizing the exceſs of acid in the urine, and allowing the latter to exert its power; and it deſerves to be remarked, that the celebrated Stephens's remedies are a combination of this kind. Calculi, compoſed of oxalate of lime, phoſphate of lime, or phoſphate of magneſia and ammonia, not being ſoluble by alkalies, the object has been attempted by the action of weak acids, like that of lemons. It is queſtionable, however, whether any acid can be given ſo as to communicate to the urine a ſolvent power. Beſides, though an acid were to remove the phoſphates, or at leaſt prevent their depoſition, it might promote the formation of uric acid concretions. If, however, the lime-water and alkalies, by operating on the animal matter of calculi, tend to deſtroy their aggregation, theſe remedies may prove ſomewhat uſeful in all the varieties of ſtone.' See Murray's Syſtem of Chemiſtry, vol. iv. p. 651, et ſeq.

Setting aſide all chemical reaſoning, we are ſorry to be obliged to confeſs that practice does not juſtify any ſtrong hopes of the ſufficient efficacy of internal medicines to diſſolve ſtones in the bladder. But though lithontriptics are not equal to this effect, they certainly aſſuage the ſeverity of the ſymptoms, which is a benefit of infinite importance to the afflicted.

Medicines conveyed into the ſtomach having failed to diſſolve urinary calculi, various practitioners have placed conſiderable expectation in the plan of introducing a ſolvent injection through a catheter directly into the bladder. It will be ſeen, from the article CATHETER in this work, that the ancients knew how to introduce fluids into the bladder many centuries before Mr. J. Foot publiſhed upon the "Veſicæ Lotura." Fourcroy and Vauquelin aſcertained, that a ley of potaſſa or ſoda, not too ſtrong to be ſwallowed, ſoftens and diſſolves ſmall calculi, compoſed of the uric acid and urate of ammonia, when they are left in the liquid a few days. They have proved that a beverage, merely acidulated with nitric or muriatic acid, diſſolves with ſtill greater quickneſs calculi formed of the phoſphate of lime, and of the ammoniaco-magneſian phoſphate. They have made out that calculi compoſed of the oxalate of lime, which are the moſt difficult of ſolution, may be ſoftened and almoſt quite diſſolved in nitric acid, greatly diluted, provided they are kept in the mixture a ſufficient time. We know then liquids that will diſſolve calculi of various compoſitions; but much difficulty occurs in employing them effectually in practice. For although we can eaſily inject them into the cavity of the bladder, this organ is ſo extremely tender and irritable, that it cannot bear the contact of any fluid, except that which it is deſtined by nature to contain, and the action of ſuch liquids upon it as would be neceſſary to diſſolve a ſtone in its cavity would not fail to produce ſufferings which no man could endure, and the moſt dangerous and fatal effects on the bladder itſelf. Another objection to this experiment is the ignorance in which the practitioner is with regard to the chemical compoſition of calculi before their extraction, and of courſe the impoſſibility of knowing what ſolvent ought to be injected. Upon this reaſon, however, it is unneceſſary to lay much ſtreſs; for were the previous more weighty objection done away, the latter difficulty might perhaps be obviated.

Deſirable, therefore, as an effectual lithontriptic is, as it would be the means of freeing the afflicted from the terrible ſufferings occaſioned by a ſtone in the bladder, and of removing all occaſion for a painful and hazardous operation, it is a melancholy truth that, notwithſtanding every expectation, ariſing either from chemical reaſoning, from quackiſh boaſtings, or from the palliation and temporary relief really obtained, we have no practicable means of diſſolving a ſtone in the living bladder. Until this grand diſcovery is made, lithotomy will ever be an indiſpenſable operation, and the views of enlightened ſurgeons ſhould ſtill be directed to render it as free as poſſible from pain and dangerous conſequences.

We ſhall now endeavour to give an impartial deſcription of the principal methods of cutting for the ſtone, beginning with ſuch as are moſt ancient, and concluding with thoſe which have been very recently ſuggeſted.

Of the Apparatus minor, Methodus Celſiana ; or cutting on the gripe.—The operation which we are about to explain is by far the oldeſt ſpecies of lithotomy, its antiquity extending back to time immemorial. Although we are indebted to the immortal Celſus for the firſt deſcription of it, he was in all probability not the original inventor. We learn from hiſtory, that Hippocrates made his pupils take an oath that they would never attempt to cut for the ſtone ; and, according to Florus, the Latin hiſtorian, the ſon of Alexander, king of Syria, periſhed, when about ten years of age, in conſequence of this operation, which had been villainouſly undertaken, though there was no ſtone in the bladder. It is plain then, that, long before the time of Celſus, the ancients were acquainted with ſome mode of lithotomy, which we may infer was what is now called the apparatus minor. This laſt appellation, deduced from the ſmall number of inſtruments required, was not employed till the commencement of the ſixteenth century, the period when another method, named the apparatus major, had its riſe. The phraſe of "cutting on the gripe," came into uſe in conſequence of the ſurgeon having to cut upon the ſtone, while he graſped it, with his fingers introduced within the rectum.

The manner of doing the operation is this. You firſt introduce the fore finger and middle finger of the left hand, dipped in oil, up the anus, and preſſing ſoftly with your right hand above the os pubis, endeavour to bring the ſtone towards the neck of the bladder ; then making an inciſion on the left ſide of the perineum, above the anus, directly upon the ſtone, you turn it out through the wound, either with your fingers or a ſcoop. Sharp on the Operations, chap. 18.

Many objections have been urged againſt this method by ſurgical authors.

1. In the firſt place it is not applicable to adults, as, in ſuch patients, it would ſeldom be found poſſible to fix the ſtone by the fingers introduced within the rectum. Celſus confined the operation to ſubjects between the ages of nine and fourteen, which is rather extraordinary, as it is more eaſy of performance the younger the child is, though certainly it hardly admits of being done at all after the patient is more than fourteen.

2. The ſame parts are not always cut, as this depends very much upon the degree of force with which the ſtone is made to project in the perineum, and the leaſt inclination to one ſide or the other muſt alſo make a conſiderable difference. When the inciſion is favourably executed, the parts cut are nearly the ſame as thoſe divided in the modern and moſt approved mode of operating. But as the operator always cuts directly on the projecting ſtone, the parts expoſed to the knife muſt vary in different caſes for the reaſons already alleged ; and the records of ſurgery prove, that in performing the apparatus minor, the urethra may be quite detached from the proſtate, or the veſicula ſeminalis and vas deferens be injured.

3. The neck of the bladder muſt ſuffer very much from rough ſtones, when conſiderable force is exerted in preſſing them towards the perineum. That this is not mere conjecture, is confirmed by the obſervations of Celſus, from whoſe account it plainly appears that, in his time, many actually died from the violence done to the bladder, in endeavouring to bring the ſtone forwards, though the operators failed in their attempt, and the patients were not cut. Fabricius Hildanus was well acquainted with all the uncertainty of cutting on the gripe, and he endeavoured to improve the method by introducing a ſtaff through the urethra into the bladder, ſo that the operator might avail himſelf of the guidance of this inſtrument in making the requiſite opening for the extraction of the ſtone. Fabricius brought the ſtone into the neck of the bladder with his fingers, which were paſſed up the rectum, juſt as Celſus deſcribes, and then, guided by the ſtaff, made ſuch a diviſion of the proſtate and neck of the bladder, as ſufficed for the paſſage of the calculus outward. The extraction was accompliſhed with a ſort of hook.

The apparatus minor, done in this manner, is by no means an ineligible operation for young male children, when the ſurgeon can eaſily graſp the ſtone with his fingers, from within the rectum. We do not mean to ſay it is raſh to make an inciſion into the bladder with a common ſcalpel, guided by a ſtaff, even though the ſtone cannot be fixed with the fingers, only the operation would then not be that of "cutting on the gripe," to which, at preſent, our remarks are limited. We agree entirely with Mr. John Bell, who, in commending the improved Celſian method, as practiſed by Fabricius, takes occaſion to remark, that you cut upon the ſtone, and of courſe make, with perfect ſecurity, an inciſion exactly proportioned to its ſize. There is no difficult nor dangerous diſſection ; no gorget, nor other dangerous inſtrument, thruſt into the bladder, with the riſk of its paſſing between that and the rectum ; you are performing, expreſsly, the lateral inciſion of Raw and Cheſelden in the moſt ſimple and favourable way. John Bell's Principles of Surgery, vol. ii.

Of the Apparatus major, or *Sectio Mariana*.—This method of cutting for the ſtone was named *Apparatus major*, from the great number of inſtruments uſed in the operation ; and *Sectio Mariana* from one Marianus, who publiſhed the firſt deſcription of it. Johannis de Romanis, a ſurgeon at Cremona, was the inventor about the year 1523, or 1525, though the exact period is very uncertain. Marianus was the ſcholar of Romanis, and having learned his maſter's art of operating, printed an account of it in Latin. The date of this treatiſe ſeems rather undetermined, Douglas making it 1522, Sharp 1524, and Sabatier a period ſubſequent to 1540.

Experience has repeatedly proved, that, in conſequence of the ſhortneſs and dilatable nature of the female urethra, calculi of conſiderable ſize may be extracted from women without employing any cutting inſtruments at all. The paſſage may be gradually dilated, ſo as to allow the forceps to be introduced into the bladder, and the ſtone taken hold of, and extracted. The adaptation of this plan to male patients was the principal object of the Marian operation. With this view, an inciſion was made into the urethra at the bulb. That part of the canal which was ſituated between the wound and the neck of the bladder, being ſhort and ſomewhat ſtraight, was thought to bear a reſemblance to the female urethra. Inſtruments were therefore paſſed into the opening, for the purpoſe of dilating ſuch portion of the urethra, ſufficiently to let the forceps be introduced, and the ſtone extracted. It was never recollected that the male urethra, where it is ſurrounded by the proſtate gland, could not rightly be compared with the meatus urinarius of the female, ſince it was totally incapable of being dilated in a degree at all adequate to the objects in view. Hence moſt dreadful injury was done to the parts, which, inſtead of yielding, were torn and contuſed in a manner ſhocking to relate.

There were various modes of executing this barbarous operation ; the following particulars, we preſume, will at once ſatiſfy the curioſity of the profeſſional reader, and make him for ever abhor a method that is ſo repugnant to the principles of good ſurgery, and the dictates of humanity and common ſenſe.

The patient was bound in the poſition uſually adopted in the more modern methods of cutting for the ſtone. After an opening had been made into the urethra, cloſe behind the bulb, much in the ſame way as is practiſed in the performance of the lateral operation, the ſurgeon uſed to introduce into the bladder, along the groove of the ſtaff, an inſtrument reſembling a ſtrong iron probe, and called a male conductor. The ſtaff was then taken out of the urethra, and the female, or grooved conductor, guided along the male one into the bladder. By means of theſe two implements, endeavours were next made to dilate the undivided portion of the urethra, and the neck of the bladder, ſufficiently to enable the operator to introduce the forceps. After much time ſpent in ſtretching the parts, the forceps were paſſed into the cavity of the bladder, and the ſtone was drawn out, though, in general, not without conſiderable force and violence. Sometimes the dilatation was attempted with a blunt gorget; ſometimes by expanding the blades of the forceps. Many operators uſed different inſtruments for the purpoſe, called dilators. Franco, Tollet, the Collots, and Alghiſi, employed them.

When we reflect that, in this method, the proſtatic portion of the urethra was left undivided, a part which is very incapable of much dilatation, we muſt know that the opening through which the forceps was introduced, and the ſtone taken out, was not formed by the elaſtic yielding of the parts; but by an actual laceration of them, attended with an immenſe deal of contuſion and violence. In what a degree ſuch miſchief muſt have taken place in caſes where the ſtone was of large ſize, is eaſily conceivable. We cannot wonder, therefore, at the ſevere, and frequently fatal, conſequences of ſo barbarous an operation. The patients very often periſhed of inflammation of the bladder and abdominal viſcera. An extenſive effuſion of blood in the ſcrotum, abſceſſes and fiſtulæ in perineo, incontinence of urine, and impotency, were alſo common conſequences. With theſe facts before us, we muſt feel ſurpriſe that the operation of Marianus ſhould have been practiſed for the ſpace of two hundred years, by ſome of the moſt diſtinguiſhed ſurgeons in Europe, as Paré, Le Dran, Le Cat, Mery, Morand, Maréchal, Raw, &c.

The foregoing account will ſerve to convey a general notion of the apparatus major, ſo famous a ſubject in the hiſtory of lithotomy; but ſuch readers as wiſh to be acquainted with all the different modes in which it was practiſed by the old ſurgeons, ought to conſult De la Médecine Opératoire, par Sabatier, tom. ii.; and the Principles of Surgery, by Mr. John Bell, vol. ii. Very clear and more conciſe deſcriptions of the apparatus major may be found in Sharp's Treatiſe on the Operations, or in Bertrandi's Traité des Opérations.

Apparatus altus.—This is the technical name given to the method in which the ſtone is extracted from the bladder, through an inciſion practiſed in the fundus of this organ from above the pubes. The inventor of this mode of cutting for the ſtone was Pierre Franco, a ſurgeon at Tourrières, in Provence. He was led to attempt the operation, from having under his care a child with a calculus, that could not be brought towards the perineum on account of its magnitude. Although the little patient ſuffered much indiſpoſition afterwards, the wound healed, and a perfect recovery followed. The proſperous event of this caſe, it ſeems, was not enough to convince Franco, that wounds of the bladder were leſs perilous than he apprehended them to be, and at the ſame time that he details the particulars of the plan he purſued, he cautions us not to imitate him. See Traité des Hernies, Lyon, 1561.

Doubtleſs, the advice delivered by Franco intimidated his contemporaries; for we find no notice taken of the apparatus altus again till 1597, when this plan of operating was recommended by Roſſetti, a well-informed and judicious phyſician, in a work entitled "Partus Cæſarius." This author repreſents it as the beſt and ſafeſt mode of cutting for the ſtone; but though he had clear ideas of the poſſibility of the method, his obſervations are not ſupported by any actual experience of his own. Afterwards, the operation was at firſt reprobated, and then adopted by Fabricius Hildanus, in caſes where the ſtone was of conſiderable ſize. It was commended by Riolan in his remarks upon the anatomy of Veſlingius; and Simon Pietre, a phyſician at Paris, wrote a memoir in favour of the operation in the year 1635. Since this period, the apparatus altus is mentioned by numerous writers, though few ſurgeons ventured to perform it. However, it is ſaid to have been practiſed by Bonnet, an old ſurgeon of the Hôtel-Dieu. At length the faculty of Paris recommended the parliament to authoriſe ſome additional experiments in regard to the apparatus altus, and Francis Collet was appointed to make the requiſite trials of the operation. The reſult was, that, in his opinion, the method was attended with great danger, and, conſequently, the practice in France was prohibited.

The apparatus altus, however, was not every where abandoned. Proby, a ſurgeon at Dublin, practiſed it for the purpoſe of extracting from the bladder of a young woman a long pin, covered with a ſtony incruſtation, which he was unable to get out through the urethra. (See Phil. Tranſ. for 1700.) Groenvelt, a Dutchman, who, in 1710, publiſhed a treatiſe on lithotomy in Engliſh, ſays, that he was under the neceſſity of removing a ſtone from the bladder by cutting above the os pubis. At length, in 1718, Dr. Douglas wrote a diſſertation in praiſe of this method of operating, which was ſoon afterwards put to the teſt of experiment by his brother, the ſurgeon, who was imitated by ſeveral Engliſh and German practitioners. In conſequence of theſe proceedings, the operation was again revived in France, and it was practiſed at St. Germain-en-Laye by Berryer, a ſurgeon of that town, and by S. F. Morand, at the Hôtel des Invalides. The latter attempt proved unſucceſsful. An account of both theſe caſes was publiſhed by Morand in 1727. The operation was afterwards much on the decline in France, and probably would have been totally given up, had not a new method of performing it been propoſed by Frère Côme. See Nouvelle Methode d'extraire la Pierre de la Veſſie Urinaire par deſſus le Pubis, à Paris, 1779.

In the apparatus altus, the deſign of the ſurgeon is to make an opening into the anterior part of the bladder above the os pubis. The patient is to be placed upon a table, or bed of ſuitable height, with his legs reaching over the edge and reſting upon a ſtool. Two aſſiſtants are to keep the patient's body and arms ſteady, while two others take hold of his thighs. The patient's trunk ſhould be ſomewhat bent forwards, in order to relax the abdominal muſcles; but it is highly neceſſary for the pelvis to be rather more raiſed than the cheſt, ſo that the inteſtines may not gravitate towards the bladder, and by depreſſing this viſcus, make it more difficult to be got at. Beſides, raiſing the pelvis above the level of the thorax prevents the ſtone from falling towards the neck of the bladder, from which ſituation the extraction would be leſs eaſy.

The operation has been executed in ſeveral ways.

The moſt ancient mode was that of cutting directly upon the ſtone, which was puſhed upwards and forwards, towards the lower and front part of the abdomen, by two fingers introduced into the rectum. Franco operated in this manner, and he was imitated by Bonnet, Heiſter, &c. While an aſſiſtant puſhes the ſtone upward, the ſurgeon is to make an inciſion through the ſkin juſt above the os pubis, and through the lower portion of the linea alba: he is then to puncture the bladder, enlarge the opening from above downwards with a probe-pointed crooked biſtoury, and, laſtly, take out the ſtone with a pair of forceps.

Roſſetti was the inventor of a particular method. In the apparatus altus, it is an object of the greateſt conſequence to make an opening into the bladder without wounding the peritoneum. Hence Roſſetti adopted the plan of diſtending the bladder with warm water, which was injected through a catheter placed in the urethra, and thus made the viſcus riſe to a convenient height above the pubes. The fluid was injected in the moſt ſlow and gradual manner, in order that it might give as little pain and uneaſineſs as poſſible. The quantity introduced was, in general, from eight to ſixteen ounces. Some authors object to an injection, and recommend the patient to retain his water till the requiſite diſtention of the bladder has taken place. When this receptacle had been filled, the catheter was withdrawn, and the fluid kept from eſcaping by an aſſiſtant, who compreſſed the urethra. The integuments and linea alba were then cut, as in Franco's method. A puncture was next made in the bladder with a biſtoury, having its edge turned towards the pubes; and the ſurgeon with his left index finger, which was directly paſſed into the opening, kept the bladder from deſcending, while he finiſhed the inciſion of that viſcus, by cutting from above downwards below the os pubis. The bladder was ſtill kept up with the index finger, until the ſtone was extracted with the forceps. In order to be ſure of having the bladder diſtended, and to be able to introduce more injection if neceſſary, Mr. Middleton uſed to keep the catheter in the urethra till the inciſions were completed. On the other hand, Douglas was in the habit of cutting down to the bladder before he introduced the catheter.

The apparatus altus has been objected to as unadapted to perſons who are either inclined to be fat, or whoſe bladders are not capacious. Unfortunately, in the generality of ſtone-patients, the bladder is much contracted. The introduction of the injection has likewiſe been found a painful and uncertain proceeding; for, very often, a ſufficient quantity could not be got into the bladder, ſo that in operating there was ſome riſk of wounding the peritoneum. The method has alſo been accuſed of frequently giving riſe to an extravaſation of urine, and ſloughing and abſceſſes in the pelvis, in conſequence of the greater facility with which that fluid eſcapes through the wound of the bladder than through the urethra. Theſe unpleaſant events have been ſaid to take place the more eaſily, as when the bladder contracts, it deſcends behind the os pubis, and the wound in it no longer continues oppoſite to that in the linea alba and integuments. Keeping a catheter in the bladder, or the patient in an horizontal poſture, has not, it is ſaid, availed in preventing the frequency or fatality of ſuch miſchief.

However, Frère Côme's method of performing the apparatus altus, which we ſhall hereafter notice, is repreſented by the French ſurgeons as being free from the preceding inconveniences. When the account of this form of the apparatus altus has been read, we entertain little doubt that the operation will appear, to all good judges, to have merit. Frère Côme is ſaid to have cut nearly a hundred patients, in the manner alluded to, with almoſt uninterrupted ſucceſs. The plan has the advantage of enabling a ſurgeon to extract larger ſtones than can be taken out of the bladder by any other method, as the inciſion may be enlarged in proportion to their ſize, and the bladder is here more yielding than in the vicinity of the proſtate gland. Nor is the paſſage of a large ſtone here reſiſted by any bony obſtacles, as in other modes of operating. See Sabatier's Médécine Operatoire, tom. ii. p. 51.

It muſt be confeſſed, that ſome difficulty might ariſe in caſe the ſtone were to break, as the fragments could not be ſo eaſily taken out as in other methods. We are to remember, however, that this accident is leſs likely to happen, becauſe the parts through which the calculus has to paſs are all ſoft and yielding. Were it to take place, the larger pieces of the calculus might be extracted by means of proper forceps, and the ſmaller ones would be carried out with the urine through the tube in the perineum.

This method, againſt which the records of ſurgery appear to adduce no ſerious objections, founded on as poſitive experience, has been entirely abandoned. Want of ſimplicity is alleged againſt it; but we think without much reaſon, for the operation, as will be ſeen from the deſcription, is not difficult; nor is the number of inſtruments immoderate. If, what Richter mentions be true, that Frère Côme cut nearly a hundred patients in this way with almoſt invariable ſucceſs, the juſtification of further trials cannot be doubted. The method, as modified by Deſchamps, who, inſtead of cutting the perineum, perforated the bladder from the rectum, has received the high ſanction of Dr. Thomſon of Edinburgh. See Edinburgh Surg. Journ. N° 13.

Lateral operation.—Since the ill conſequences of the apparatus major were chiefly owing to the diſtention, contuſion, and laceration which the membranous and proſtatic portions of the urethra, and the neck of the bladder itſelf ſuffered, the idea of preventing ſuch miſchief, by cutting theſe parts to a ſufficient extent, ſeemed almoſt a certain and natural effect of any reflection beſtowed on the ſubject. The making of ſuch an inciſion conſtitutes all the particularity of the lateral operation; but as the lower ſide of the urethra cannot be divided far enough without the rectum being wounded, the cut is directed ſideways, from which circumſtance the name of the method is derived.

The lateral operation being that which, under various modifications, has now taken the place of every other method of cutting for the ſtone, it ſeems proper to give ſome account of its origin and progreſſive improvement, and of the different modes of executing it, with gorgets and a variety of lithotomes and knives.

In September, 1697, a ſort of monk, named Frère Jacques de Beaulieu, went to Paris, taking with him numerous certificates of the many cures which he had accompliſhed in ſundry places, and announcing his deſire to teach the ſurgeons of that city a new method of cutting for the ſtone. He paid his reſpects to Maréchal, then principal ſurgeon to La Charité, and requeſted leave to operate upon ſome of the patients in that hoſpital. Maréchal, however, did not think proper to truſt the living to a man, of whoſe qualifications he was entirely ignorant, and all that Frère Jacques could get granted, was permiſſion to exhibit his mode of operating upon a dead body. The reſult was, that his plan was not conſidered advantageous, and, diſſatisfied with the reception he had experienced, he quitted Paris in October, and repaired to Fontainbleau, the ſeat of the court. Here he cut for the ſtone a lad, who, in three weeks after the operation, was ſeen walking quite well about the ſtreets.

Frère Jacques put his patients under no preparatory treatment before the operation ; he placed them on the edge of a table, with a pillow under their heads, and with their legs and thighs bent and ſeparated from each other, in ſuch a way, that their heels approached their buttocks. He did not bind his patients in this poſture ; but made ſome ſtrong aſſiſtants hold them. Then, having introduced into the bladder a round, ſolid, ungrooved ſtaff, he took a long narrow knife, and made an oblique inciſion in the perineum, along the internal part of the tuberoſity and ramus of the iſchium, cutting from below upwards. In this way, he cut all the parts which preſented themſelves, without taking out the ſtaff. He now introduced his finger into the wound, in order to aſcertain the ſituation of the ſtone, and enlarged the internal opening with an inſtrument much like a ſcratching knife, but which only had one cutting edge. On this inſtrument, which he called his conductor, he paſſed the forceps into the bladder. The ſolid ſtaff was then withdrawn from the urethra, and the calculus extracted. Laſtly, ſome linen dipped in a mixture of oil and wine was applied to the wound, and the operator took final leave of his patients, telling them, that the operation was done, and that God would complete the cure.

Frère Jacques' ſucceſs at Fontainbleau changed the public opinion ſo much in his favour, that it was determined to let him operate, in the enſuing ſpring, on the patients in the Hôtel Dieu and La Charité. He was directed, however, to make ſome previous trials of his method upon the dead ſubject in the preſence of Méry, who was ordered to furniſh a report on the matter. Méry's firſt declaration was quite favourable to Frère Jacques, as it ſtated, that the neck and body of the bladder were cut inſtead of being dilated, as they were in the ordinary method at that time ; that as the ſtone was extracted at the wideſt part of the arch of the pubes, the ſymptoms were likely to be milder ; and, among other circumſtances, that the internal parts were leſs expoſed to be torn and bruiſed. Méry thought Frère Jacques' inſtruments not ſo eligible as thoſe in previous uſe, and particularly objected to the ſtaff, which, having no groove, ſerved as a very indifferent guide to the knife.

Under Méry's inſpection, Frère Jacques made further trials of the new method on dead bodies, and a ſecond report, drawn up by the former, was much leſs propitious than that which had been previouſly delivered. But neither this circumſtance, nor ſome unfortunate operations which Frère Jacques had lately performed at Verſailles and Paris, led to a rejection of the new plan ; for forty-two ſtone patients, in the Hôtel Dieu, and eighteen in La Charité, were now put under his care. Nothing could ſurpaſs the general eagerneſs to ſee him operate. There was not a phyſician, nor a ſurgeon, who was not proud of being his aſſiſtant. In ſhort, ſo vaſt was the concourſe of ſpectators, or rather, of thoſe who wiſhed to be ſuch, that guards were found neceſſary to preſerve order. Of the above ſixty patients, twenty-three died. Only thirteen were perfectly cured, and even in ſome of theſe the wound is ſaid to have afterwards broken out again. The other twenty-four remained in the hoſpitals ; ſome with an incontinence of urine ; others with fiſtulæ ; and all in a reduced ſtate, from which they are ſaid to have never recovered. On examining the bodies of the deceaſed, it appeared that, in ſome inſtances, the fundus of the bladder was wounded, while in others, the neck of this viſcus was entirely ſeparated from the urethra ; that, in women, the vagina was conſtantly pierced in two oppoſite places ; that, in both ſexes, the rectum was frequently opened ; and that, in all caſes, the parts were terribly hacked, in conſequence of no guide for the knife, and no conductor having been employed.

The ill ſucceſs of Frère Jacques' operations did not produce ſimilar ſentiments in every mind. Felix and Fagon, in France, thought that his method had merit, and that, when improved in particular points, which they ſuggeſted, it might be made far ſuperior to any other mode of cutting for the ſtone. Frère Jacques profited ſo much by their advice, that, in 1699, he operated on about ſixty perſons, moſt of whom got quite well. He ſpent the enſuing winter at Verſailles, as an inmate with Fagon, and there repeatedly practiſed lithotomy on the dead ſubject. Duverney diſſected the bodies, and though he found Frère Jacques' method far preferable to the apparatus major, which was then the only other plan in uſe, he was of opinion with Méry, " that the ſtaff would be better with a groove, as its round and ſolid form was ill ſuited for the guidance of the knife." Frère Jacques, ever ready to receive inſtruction, loſt no time in adopting the improvement. He had new ſtaffs conſtructed, and continued to employ them the reſt of his life.

In the ſpring of 1701, this celebrated lithotomiſt cut thirty-eight patients for the ſtone at Verſailles. Theſe all recovered. Fagon, who was afflicted with the diſorder, could not reſolve to put himſelf under the care of the new operator ; but was operated upon and cured by Maréchal. Frère Jacques, ſomewhat piqued at this circumſtance, quitted Verſailles, with the intention of never returning thither ; but, in 1702, he was induced to re-viſit the place at the inſtance of the Marſhal de Lorges, who was afflicted with the ſtone, and under whoſe roof were lodged twenty-two poor patients with calculi. Theſe were all operated upon with ſucceſs ; but the Marſhal, whoſe bladder contained fungous excreſcences, and ſeven ſmall ſtones, the extraction of which was tedious, died the day after ſubmitting to the operation. In conſequence of this accident, Frère Jacques determined to go into Holland. Here his ſucceſs muſt have been very conſiderable ; for he was thrice engraved ; and at Bruſſels, whither he was ſent by the magiſtrates of Amſterdam, a medal was ſtruck in honour of him, with this inſcription : *Pro ſervatis civibus.* The motto of one of the engravings is the following paſſage from Cicero : *Ægri, quia non omnes convaleſcunt, non idcirco ars nulla medicina eſt.* This alludes to the many hoſtile criticiſms which had been iſſued againſt him.

In 1712, Frère Jacques, being ſixty years of age, returned to Beſançon, his native place, where he ſoon afterwards died.

While he was at Amſterdam, his mode of operating had been obſerved by the famous Raw, who at once perceived, that the method was infinitely preferable to the apparatus major, and who, after ſome trials on the dead ſubject, put it in practice on the living. Raw's ſucceſs exceeded every thing heard of before : beſides extracting the ſtone with the utmoſt eaſe, he cured all his patients without exception. His reputation ſpread every where. Surgeons flocked from all parts to Amſterdam, in order to ſee him operate and receive his inſtructions. He cared not how many ſpectators he had ; but no one could prevail on him to divulge the particulars of his plan. To every ſolicitation on this point, his uſual reply was, " Celſum legitote," which ſeems to hint, that he was in the habit of cutting the ſame parts as were divided in the ancient operation of the apparatus minor. It is aſſerted, that he cut for the ſtone 1540 patients, and (what is almoſt incredible) they are all ſtated to have recovered, ſo that there was never any opportunity of diſſecting the bodies of any of his patients.

It was for a long while preſumed, that Raw made an opening into the bladder, without touching the neck of this viſcus, or cutting the proſtate gland. This, at leaſt, was the ſentiment of Albinus the father; but, in latter times, the general concluſion has been, that Raw muſt have divided theſe parts.

After Raw's death in 1719, experiments were made, in order to aſcertain his mode of performing lithotomy. Among others engaged in this object was Cheſelden, who, when the bladder was diſtended with an injection, ſucceeded in making an opening into this viſcus, without injuring its neck. Having tried this plan, however, on ſome of his patients, he ſoon found, that it was very liable to be followed by a fatal extravaſation of urine in the pelvis, and, conſequently, he renounced it for ever. His experiments were ſtill carried on, and at length he was convinced, that in operating with the inſtruments, and in the manner of Raw, as deſcribed by Albinus, it was impoſſible to make an opening into the bladder, without cutting the membranous part of the urethra, and the proſtate gland. Cheſelden now ſtopped his inveſtigations, and directed all his abilities to the eaſy accompliſhment of ſuch an operation. The knife, commonly employed on other occaſions, ſeemed to Cheſelden much more convenient than the pointed lithotome uſed by the Dutch ſurgeons. Inſtead of the male and female conductor in uſe with Raw, Cheſelden preferred a blunt gorget for guiding the forceps into the bladder; but he altered the handle, which, inſtead of repreſenting a ſort of croſs, was now oval, and made to incline to the left.

Having abandoned the method imputed to Raw by Albinus, Cheſelden tried a ſecond plan, which was as follows: the patient being placed in the poſture uſually choſen for lithotomy by modern operators, a grooved ſtaff was introduced into the bladder. The handle of this inſtrument was inclined towards the right groin, and firmly held by an aſſiſtant with one hand, while, with the other, the ſcrotum was ſupported. The ſkin of the perineum having been made tenſe with the operator's left thumb, a free oblique inciſion was made with a convex edged ſcalpel, much in the ſame way as is commonly done at the preſent day. The fat was next deeply cut through. The left index finger was then introduced into the upper angle of the wound, and the groove of the ſtaff being felt through the parietes of the urethra, a cut was made into this canal. The aſſiſtant that had the care of the ſtaff, was now directed to draw its concavity upward as cloſely as poſſible under the arch of the pubes, away from the rectum. All that remained to be done, was to divide the membranous part of the urethra and the neck of the bladder. This was executed by puſhing the point of the knife along the groove of the ſtaff, under the guidance of the left index finger, which, in this ſtep of the operation, was kept on the back of the ſcalpel. Having reached the proſtate gland, the inciſion was completed by the knife being moved downwards and outwards, with its edge turned towards the tuberoſity of the iſchium.

The left index finger, remaining in the wound, ſerved to guide the beak of the blunt gorget into the groove of the ſtaff. The operator now took hold of the handle of this laſt inſtrument, and, after bringing it downwards and forwards, conducted the gorget into the bladder. The ſtaff was withdrawn, the forceps introduced along the concavity of the gorget, and the ſtone extracted. Such was Cheſelden's ſecond method. It was this operation which Morand gave an account of to the French ſurgeons, after ſeeing it performed during his viſit to England at the expence of the Royal Academy of Sciences; and it is particularly worthy of notice, that foreign ſurgical writers ſeem unaware, that Cheſelden afterwards gave the preference to a third plan of operating, which has been deſcribed by Douglas in his ſecond Hiſtory of the Lateral Operation, publiſhed 1731.

We are not very well acquainted with the reaſons which led Cheſelden to abandon his ſecond method. He had, however, candidly confeſſed to Morand, that in puſhing the knife backwards along the groove of the ſtaff, he had in two inſtances wounded the rectum. Beſides, it is conjectured, that the inciſion of the proſtate gland was often too ſmall for the free tranſmiſſion of the ſtone.

Cheſelden's third, and what he conſidered as his beſt method of cutting for the ſtone, did not differ in point of principle from his ſecond plan. The ſame parts were cut, namely, the membranous part of the urethra, and the proſtate gland. The change conſiſted in a different mode of executing the inciſion, "which was now performed by moving the knife from behind forwards," inſtead of from before backwards, as in the ſecond method.

The following is the deſcription of Cheſelden's laſt and moſt improved plan, as given to us by Douglas. "In performing the lateral operation, he makes the firſt, or outward inciſion, from above downwards; beginning on the left ſide of the raphe, or ſeam, betwixt the ſcrotum and the verge of the anus, almoſt as high as where the ſkin of the perineum begins to dilate and form the bag that contains the teſticles, and from thence he continues the wound obliquely outwards, as low down as the middle of the margin of the anus, at about half an inch diſtant from it near the ſkin, and, conſequently, beyond the great protuberance of the os iſchium.

"The firſt or upper part of this inciſion is cut ſuperficial; after that, 'he plunges his knife much deeper by the ſide of the rectum, and finiſhes it by drawing his knife obliquely towards himſelf.' Theſe three motions may always be obſerved in his external inciſion; but the laſt is performed pretty much at random; his knife firſt enters the groove of the 'roſtrated or ſtraight part of the catheter, through the ſide of the bladder, immediately above the proſtate;' and afterwards, the point of it continuing to run in the ſame groove, in a direction downwards and forwards, or towards himſelf, he divides that part of the ſphincter of the bladder that lies upon the gland; and then he cuts the outſide of one-half of it obliquely, according to the direction of the whole length of the urethra that runs within it, and finiſhes his internal inciſion by dividing the muſcular portion of the urethra on the convex part of the ſtaff."

The ſecond and third of Cheſelden's methods, then, reſembled each other in the parts cut; but the firſt and third were eſſentially different, notwithſtanding the knife was in each of them plunged at once into the body of the bladder behind the proſtate gland. Cheſelden, in his firſt operation, only imitated Frère Jacques and Raw, and paſſed his knife into the bladder betwixt the veſiculæ ſeminales and tuber iſchii. He ſtopped at the back part of the proſtate gland. All his inciſion lay behind this gland. "He cut the body of the bladder only." But, in his laſt operation, he cut no part of the body of the bladder; "he introduced his knife cloſe behind the proſtate gland, and in drawing it towards him, he of courſe cut only the neck of the bladder where it is ſurrounded by that gland." John Bell's Principles, vol. ii. p. 153.

In operating after the manner aſcribed to Raw, Cheſelden loſt four patients out of ten; but in purſuing his own improved method, his ſucceſs was moſt brilliant, for, of fifty-two patients whom he ſucceſſively cut for the ſtone, all were ſaved excepting two; and it is well known, that out of two hundred and thirteen perſons, of all ages, conſtitutions, &c. on whom he operated, only twenty died. What lithotomiſt of the preſent day can boaſt of equal ſucceſs? We have ſeen lithotomy performed rather frequently with cutting gorgets of different deſcriptions, in the manner that has been of late years moſt prevalent. Out of every ſeven or eight operations, at leaſt one has had a fatal termination. We make this ſtatement with ſome degree of confidence, as we know it might be confirmed by the moſt reſpectable and impartial evidence. To what then are we to refer the few failures which Cheſelden experienced, and the vaſt number of deaths conſequent to the preſent common plan of cutting for the ſtone. The reply, in our opinion, is obvious. Cheſelden made an ample and direct inciſion into the bladder with a ſharp knife, the inſtrument, of all others, the beſt calculated for effecting a clean ſmooth diviſion of the parts, without any laceration, contuſion, or other additional injury. The moderns often make their external inciſion too ſmall, and too high up, while the internal cut, which is executed with a gorget, is almoſt always too diminutive for the eaſy paſſage of any calculi above a very moderate ſize. The difficulty of extraction muſt evidently be increaſed by the external wound being conſiderably higher up, than the internal diviſion of the proſtate gland and neck of the bladder, ſince the paſſage through which the ſtone muſt be drawn out, beſides being too ſmall, does not lead directly into the cavity of the bladder. Cheſelden, in uſing the knife, had occaſion to exert no force nor roughneſs. The moderns, whoſe gorgets are ſometimes very badly conſtructed, are often under the neceſſity of puſhing ſuch inſtruments moſt forcibly, ere the opening into the bladder can be made. The violence and injury which the parts muſt thus ſuffer, in addition to their ſimple diviſion, require from us no comment. Cheſelden, having the advantage of a free and direct opening into the bladder, never bruiſed and injured the interior of this viſcus by tedious ſearches after the ſtone with the forceps; nor when he had graſped the foreign body, did he ever bruiſe and lacerate the parts in drawing it out. His conſtant plan, on firſt introducing the forceps, was to ſearch *gently* for the ſtone *with their blades ſhut*. When he had got hold of the ſtone, he uſed to extract it "with a very ſlow motion, in order to let the parts yield as much as poſſible." On the contrary, the moderns, generally having too ſmall an opening, are often obliged to introduce and withdraw the forceps twenty or thirty times before they can accompliſh the extraction of the ſtone. Deſirous of ſhortening the buſineſs, they are guilty of manual roughneſs and violence; and not only the bladder, but the parts through which the ſtone has to paſs, are dreadfully bruiſed and injured. Some operations which we have witneſſed have been ſo long, and executed with ſuch awkwardneſs and want of gentleneſs, that we cannot help ſuſpecting, that the bladder muſt actually have been in a ſtate of inflammation before the poor patients were removed from the operating table.

Cheſelden undoubtedly was one of the moſt expert and ſucceſsful lithotomiſts that ever lived in any country, and his mode of operating, which is fully explained to us, ought, in our opinion, never to have been abandoned for the employment of cutting gorgets.

Of the beſt way of executing the lateral operation with cutting gorgets.—We ſuppoſe it muſt have been ignorance of anatomy, joined with timidity and want of judgment, that could induce ſurgeons to give up ſo excellent a plan of operating as that which was invented and practiſed by Cheſelden; for, admitting that it is ſomewhat eaſier to make the lateral inciſion with a cutting gorget, there is yet a more intereſting and weighty matter for conſideration, namely, whether the recoveries after the latter operation are, upon the whole, as numerous as thoſe which followed Cheſelden's method. This eminent ſurgeon, as we have already noticed, cut for the ſtone fifty-two patients in ſucceſſion, of whom only two died. No ſurgeon of the preſent day, in the habit of uſing a cutting gorget, can boaſt of ſucceſs at all equal to this. Our obſervation tends to the concluſion, that about one out of every ſeven or eight patients cut for the ſtone, with ſome kind of ſharp gorget, falls a victim to the operation. According to our ſentiments, a ſurgeon ſhould not regulate his conduct ſo much by the facility, as the ſucceſs of any plan; and a little more trouble and difficulty ought to be no objections, where they ſerve to give the patient a greater chance of preſervation. We know that a man cannot imitate Cheſelden, without having a requiſite knowledge of the anatomy of the parts in the perineum, and about the neck of the bladder. We can conceive at the ſame time, that a perſon might learn to operate mechanically with a gorget, and yet be totally unacquainted with the ſtructure and ſituation of the parts intereſted in the operation. It is this removal of all occaſion for ſtudy and application, that has had more effect, than any thing elſe, in keeping up the preſent ſyſtem of doing the office of the knife, with that very objectionable inſtrument a cutting gorget.

The patient is to be placed at the edge of a firm table, and the ſtaff is to be introduced into the bladder.

Then two garters, each about two yards long, are to be doubled, and put, by means of a nooſe, round the patient's wriſts. The patient is now to be deſired to take hold of the outſide of his feet with his hands, in ſuch a manner, that the fingers are applied to the ſoles, and the palms to the inſteps. The two ends of the ligature are then to be carried round the ankle, next over the back of the hand, and under the foot. Laſtly, they are to be tied. In this manner, each hand and foot may be ſecurely connected together, and the patient is fixed in the poſition the beſt ſuited for the operation.

The ſtaff, the firſt inſtrument with which the ſurgeon has any concern, is in fact nothing more than a director, adapted in ſhape to the courſe of the urethra, and furniſhed with a groove for guiding a cutting inſtrument into the bladder. (See *Surgical Plates.*) It is ſhaped very much like a ſound, or catheter. However, it is generally ſomewhat longer and more curved, and while the handle of a ſound is as ſmooth and highly poliſhed as poſſible, that of a ſtaff ought to have a rough ſurface, in order that it may be held with greater ſteadineſs and firmneſs. Two advantages ariſe from having the ſtaff ſufficiently curved; *viz.* its convexity is more plainly diſtinguiſhable in the perineum; and on depreſſing the handle of the inſtrument, that part of the groove which is at the neck and within the cavity of the bladder, may be more readily made to aſſume a direction correſponding to the axis of this viſcus. The utility of the length of the inſtrument is very obvious, as the operator is thereby leſs liable to ſuppoſe the extremity of the ſtaff to be within the bladder, when it is not ſo; and it is plain, that the groove ſhould always extend beyond the beak of the gorget, even when the latter inſtrument has been puſhed as far as the operator judges requiſite.

An aſſiſtant is to hold the ſtaff, making its convexity prominent in the perineum, by preſſing the whole inſtrument downwards, and inclining its handle towards the patient's abdomen. The perſon who has charge of the ſtaff, ſhould alſo turn the groove a little towards the left ſide of the perineum,

neum, and raiſe the ſcrotum with his left hand, in order to expoſe the perineum completely to the ſurgeon's view.

The next conſideration is the manner of making the external inciſion. A moſt common error is that of beginning the cut too high up. Nearly all the old ſurgeons commit this fault, by commencing the inciſion over the bulb of the urethra. This practice is above all things diſadvantageous, eſpecially when the operator makes the outward wound rather too ſmall. Suppoſe, for inſtance, that the ſurgeon begins the inciſion as high as the bulb of the urethra, and does not carry it ſufficiently far downwards; and that he next divides the proſtate gland and neck of the bladder with the gorget. Now, on attempting to take out the ſtone, the external part of the wound is too high, in regard to the internal portion; and the paſſage, through which the ſtone is to be extracted, not being ſtraight and direct, as much impediment to the extraction is thereby occaſioned as from the circumſtance of the wound being too ſmall. We are decidedly of opinion, that "a free and direct opening for the paſſage of the ſtone ought always to be made in the operation of lithotomy;" and that the fatal termination of numerous caſes is entirely owing to the wound not being ſufficiently ample and direct. The laceration of the parts, which muſt happen under ſuch circumſtances, is too frequently productive of peritoneal inflammation, the moſt alarming conſequence of the operation. Nothing has a greater tendency to render the wound indirect, than making the inciſion through the ſkin too high up; or, in other words, ſo high as to intereſt the bulb of the urethra.

On the contrary, the wound ſhould commence over the membranous part of the urethra, at the place where the operator means to make his firſt cut into the groove of the ſtaff; and the inciſion is to extend about three inches obliquely downwards, to the left of the raphe of the perineum. The point to which it ought to be directed, is the centre of a line drawn from the anus to the tuberoſity of the iſchium.

The requiſite diviſion of the integuments being made, the next object is to divide the tranſverſales perinæi muſcles, and to make an opening into the membranous part of the urethra, ſo as to be able to feel diſtinctly with the finger the groove and edges of the ſtaff.

The operator has now to accompliſh a very important object, and one that is for the moſt part ſadly neglected: we allude to cutting the left ſide of the urethra with the knife, as far as poſſible along the groove of the ſtaff towards the bladder. In doing this, the point of the ſcalpel ſhould be placed in the groove of the ſtaff, and the edge be turned to the left, while the operator's left fore-finger, applied to the back of the blade, ſerves to guide its courſe with greater ſteadineſs and ſecurity. When this part of the operation is carefully done, very little remains to be effected by the gorget.

Were the ſurgeon, with too much boldneſs, to lay open the lower part of the urethra onward to the bladder, he would inevitably wound the rectum; "becauſe," as an excellent writer has obſerved, "the inciſion being carried on from the urethra, it will neceſſarily lead to that part of the neck of the bladder that lies upon, and is contiguous to, the rectum." (Sharp in Critical Inquiry, &c. p. 212. edit. 4.) But when the urethra is divided in the manner above recommended, with the edge of the ſcalpel turned ſideways, no riſk of cutting the inteſtine is encountered.

The next important ſtep is to divide the proſtate gland and neck of the bladder; for which purpoſe, the gorget, that diſgraceful inſtrument, which we ſhould like to ſee expelled from ſurgery, is deſigned.

Mr. Serjeant Hawkins has made his name exceedingly famous, by his having been the inventor of cutting gorgets. We have already related how the ancient ſurgeons ſometimes employed blunt gorgets for dilating the parts, in the performance of the apparatus major. A reference to the ſurgical plates of this work will more readily convey an idea of what a gorget is, than any verbal deſcription. There we have given repreſentations of the blunt gorget, as well as of ſharp gorgets, deviſed by Hawkins, Cline, and Abernethy. The gorget of Mr. Cline appears to us the moſt eligible, as it will make the freeſt opening into the bladder, and cut in the moſt deſirable direction. Its edge, being quite ſtraight, may be readily ground very ſharp, and is beſt ſuited for making an even clean inciſion. By cutting laterally, inſtead of more or leſs obliquely upwards, a larger inciſion may be ſafely made with it than with moſt other gorgets, which, having their edges turned upwards, cut in a direction where the rami of the oſſa iſchium converge, and leave inſufficient room for the eaſy paſſage of a large ſtone; and where alſo the trunk of the pudendal artery is liable to be injured, in making a wound even of moderate extent. We are firmly perſuaded of the truth of Ponteau's opinion, that the ſtone ought always to be extracted where the arch of the pubes is wideſt. Cline's gorget, beſides having the material advantages of making the freeſt opening, and cutting in the moſt deſirable direction, alſo poſſeſſes the excellence of being diveſted of that very uſeleſs and objectionable part, the blunt prominence on the left hand of the beak, ſometimes termed the ſhoulder of the gorget. This ſhould always be filed away, as it can only ſerve to render the introduction of the inſtrument more difficult.

We ſhould like Mr. Abernethy's gorget very well, if its edge were ſomewhat more extenſive, and had a more horizontal direction. But the firſt improvement would be improper without the laſt; ſince a freer cut ſo much upwards muſt endanger the pudendal artery.

Every ſurgeon, before undertaking lithotomy, ſhould be careful that the beak of the gorget and the groove of the ſtaff fit each other with preciſion. The embarraſſment and riſk of doing miſchief, into which the operator would fall, could he not make the beak ſlide along the groove, muſt be plain to every underſtanding.

Having divided the urethra a conſiderable way towards the neck of the bladder, in the manner explained above, the operator is to place the beak of the gorget in the groove of the ſtaff; and, being ſure that this is accompliſhed, he is to riſe from his chair, and take hold of the handle of the ſtaff with his left hand, while with his right he holds the gorget with its beak carefully maintained in the groove of the ſtaff, along which it is to glide into the bladder. But, before puſhing the gorget onward, a moſt important thing is to be obſerved: this is "to bring forward the handle of the ſtaff, ſo as to elevate the extremity of the inſtrument in the bladder; by which means, the gorget can be introduced along the groove of the ſtaff, in the direction of the axis of the above viſcus. In fact, the gorget ſhould always be introduced nearly in a direction correſponding to a line drawn from the os coccygis to the umbilicus." By following this plan, the gorget can hardly ever wound the rectum, or inſinuate itſelf into the cellular ſubſtance between this inteſtine and the bladder. It is evident, however, that there can be no ſafety, if the beak of the gorget ſhould happen to ſlip out of the groove, which is deſigned to guide it.

Immediately the gorget has been introduced, the ſtaff is to be withdrawn, and a ſuitable pair of forceps is to be paſſed, along the upper ſurface of the gorget, into the bladder, for the purpoſe of ſeizing and extracting the ſtone.

While the operator is paſſing the forceps along the gorget, the latter inſtrument muſt be kept quite motionleſs, leſt its ſharp edge ſhould do miſchief; and as ſoon as the forceps is in the bladder, the cutting gorget is alſo to be taken away.

Delineations of the forceps, uſed in lithotomy, will be found in the ſurgical plates of this work. We ſhall only obſerve, reſpecting this inſtrument, that the operator ſhould be provided with at leaſt three or four pairs of different ſizes; and that they are commonly made of too thick and clumſy a conſtruction, whereby they of themſelves almoſt occupy the whole of the paſſage through which the ſtone is to be drawn.

Our deſcription has now advanced to that point of the operation, when the ſtaff and gorget have been withdrawn, leaving the forceps introduced. The next object is to get hold of the ſtone with the forceps. In doing this, the ſurgeon will do well to remember the judicious mode purſued by Cheſelden, as detailed in our account of this gentleman's improvements. He ſhould not unmeaningly expand the inſtrument, as ſoon as it is in the bladder; neither ſhould he awkwardly thruſt it about at random, without any determinate ſcheme. The moſt adviſable method at firſt is not to open the forceps, but uſe the inſtrument as a kind of probe, for aſcertaining the exact ſituation of the ſtone. If this body ſhould be lodged at the lower part of the bladder, juſt behind the neck of this viſcus, as is moſtly the caſe, and be diſtinctly felt below the blades of the forceps, the operator is to open the inſtrument immediately over the ſtone, and, after depreſſing the blades a little, is to ſhut them, ſo as to graſp it. Great care, however, muſt be taken not to ſhut the inſtrument in any other than a gentle manner, as breaking the ſtone is an exceedingly unpleaſant and troubleſome occurrence. Cheſelden, we are informed, uſed, when the ſtone was found ſoft, to interpoſe his finger between the blades of the forceps, in order to keep them from making too much preſſure. Certainly it is far more ſcientific to uſe the forceps at firſt, merely to aſcertain the poſition of the ſtone; for, when this is known, the operator can much more eaſily graſp the extraneous body in a ſkilful manner, than if he were to open the blades of the inſtrument immediately, without knowing where they ought next to be placed, or when ſhut. No man can doubt, that the injury which the bladder frequently ſuffers, from reiterated and awkward movements of the forceps, has a conſiderable ſhare in giving riſe to ſuch inflammation of the viſcus, as often ſpreads to the peritoneum and bowels, and occaſions death.

When the ſtone is found to be ſo large, that it cannot be extracted without violence and laceration, the ſurgeon may either break the ſtone with a ſtrong pair of forceps, conſtructed with teeth for that purpoſe; or by means of Mr. H. Earle's inſtrument; or elſe he may enlarge the wound with a common ſcalpel, or a probe-pointed biſtoury, introduced under the guidance of the fore-finger of the left hand.

To the employment of the knife, in this circumſtance, we have to expreſs our decided preference. Breaking the ſtone in the bladder ſhould always be avoided, if poſſible; as it creates ſuch a chance of calculous fragments being left behind, and obliges the ſurgeon to diſturb and hurt the bladder too much by the repeated introductions of the forceps. We wiſh it, however, to be well underſtood, that when the ſtone is exceſſively large, and cannot be brought through as free an opening as can be prudently made, without the employment of unwarrantable force, it is the duty of the operator to try to break it.

When this has been done, and as many of the broken pieces have been taken out as can be diſcovered with the forceps, the ſurgeon ſhould introduce his finger, in order to feel whether any fragments ſtill remain behind. If they ſhould do ſo, his beſt plan, provided they are very ſmall, is to inject lukewarm water, with moderate force, through the wound into the bladder, for the purpoſe of waſhing them out. A ſort of ſcoop, uſually contained in every caſe of inſtruments for lithotomy, may ſometimes be uſeful in extracting pieces of broken calculi. See the ſurgical plates.

The operator ought always to examine a ſtone as ſoon as it is extracted; if its whole ſurface be rough, it is a preſumptive ſign that there is no other calculus preſent; if its outſide ſhould be ſmooth on one ſide and rough on the other, it is not improbable that there are other ſtones. But in every inſtance, the ſurgeon ſhould introduce his fore-finger, in order to obtain deciſive information on this point; for it would be unpardonable to put the patient to bed while another ſtone remains in his bladder.

Sometimes ſtones cannot be graſped with the forceps, unleſs raiſed by the index and middle finger of the left hand, introduced into the rectum. Firſt Lines of the Practice of Surgery, p. 532—537. edit. ii.

Of the objections to cutting gorgets.—Mr. John Bell of Edinburgh, in his Principles of Surgery, vol. ii. has freely delivered his ſentiments on the dangers and diſadvantages of the cutting gorget, and as we think there is much reaſon and truth in what he has ſaid, his obſervations appear to us well worthy of the moſt ſerious conſideration. They tend to ſhew that there is no method of performing lithotomy ſo excellent as that with only a ſtaff and a ſcalpel, and that if ſurgeons would take the trouble to qualify themſelves for this laſt mode of operating, a thing by no means difficult, all cutting gorgets might be for ever laid aſide, to the great benefit of mankind, and the real improvement of ſurgery. Mr. John Bell reminds us that "*the gorget ſlips!* and all the ſurgeons of Europe confeſs it! it ſlips in the hands of the moſt ſkilful ſurgeons, and no one can be reſponſible for the conſequences of a thruſt ſo deſperate, and requiring ſo much force. It ſlips ſo frequently, and is avowedly ſo little under the controul of the operator, that no man ventures to blame his brother for a misfortune which may happen in his own hand. So imperfect is the inſtrument, and ſo dangerous this plunge, that to prevent the gorget being driven through the fundus of the bladder, is a point of ſo much importance as to occupy, to this day, the genius of inventors, who have thought to guard the edge by a double, or ſlipping gorget! and ſo far is the inciſion, after it is ſafely made, from being adequate to the extraction of the ſtone, that the ſize and form of the gorget, and eſpecially the expanſion of its blade, and the broadneſs of its cutting edge, varies every day. The inſtrument was once conical, but is now cylindrical; it was once narrow, but is now broad; it was once double, with the beak in the centre; it is now ſingle, with the beak on one ſide; when firſt ſharpened by ſir Cæſar Hawkins, it was round, becauſe it had been immediately before a mere dilator; it is now flat, and entirely reſembles a knife.

"It is not without reluctance, (proceeds Mr. John Bell,) that I rank this among the inventions, where mechaniſm is ſubſtituted for ſkill. If this form of inſtrument were found ſafe in practice, I ſhould be as little apt as any man to be infected by ſpeculative fears; but it is a murderous weapon! When the daſh is made with the gorget, either it is at once ſucceſsful, or, if wrong, is irretrievably ſo; for though in operating with the knife, you can make a ſecond inciſion, in operating with the gorget, if you fail in the firſt, you can make no ſecond plunge. The beſt operators in this country, among whom I have no doubt I may reckon Mr.

Earle, acknowledge the dangers of this operation in the fulleſt and moſt unqualified terms: ‘I have more than once known a gorget, though paſſed in the right direction, puſhed on ſo far, and with ſuch violence, as to go through the oppoſite ſide of the bladder.’ (Earle on the Stone, p. 33.) I have myſelf, (ſays Mr. John Bell,) ſeen it driven, God knows where, deep out of ſight, up to the hilt, without one drop of urine iſſuing, without the operator ever reaching the ſtone. Obſerve but the force with which the operator drives in the gorget; mark the ſtruggle with which he diſengages the beak of the gorget from the groove of the ſtaff; hearken to the audible clack with which the beak of the gorget ſhoots off from the groove of the ſtaff; and if this moment of violence do not conſpire with the outcries of the unhappy patient to perſuade you of the dangers of this operation, you can have but little pretenſion to either feeling or knowledge. Such is the rude violence with which the gorget is driven inwards, that Bromfield, even when operating with a blunt gorget, a mere dilator burſt through the bladder and peritoneum; his gorget went almoſt beyond his reach into the abdomen, while the bowels of the boy fell down into his hands.

“But, (ſays Mr. J. Bell,) there is one paramount objection, independent of the many dangers which attend this puſh of the gorget; ‘the inſtrument, guide it how you will, makes an inciſion inadequate to the eaſy extraction of the ſtone!’ I have often compared the inciſions I have made with the knife and with the gorget, upon the dead body. I have obſerved alſo, in the time of operating, how difficultly the opening of the proſtate admits even the forceps, how impoſſible that ſuch an imperfect inciſion ſhould eaſily allow the extraction of the ſtone. In all caſes of particular difficulty, where, uſing the privilege of an aſſiſtant, I have introduced my finger, I have felt diſtinctly the ſtricture of the gland, the greater part of it being left entire. The inciſion in the gland often admits the forceps ſo difficultly, that I am well aſſured the gland itſelf has ſometimes, by the mere puſhing of the forceps againſt this firm and narrow opening, been entirely ſeparated from the urethra! and after the forceps are puſhed ſucceſsfully through this narrow opening, and the ſtone caught betwixt their blades, all that remains of the gland is inevitably lacerated with much danger and pain. But I would more willingly quote any authority than that of my own diſſections, or experience. Camper, who has ſtudied this ſubject, ſays “incredibile eſt, quàm parva plaga ab omnibus etiam dexterrimis infligatur; nunquam forcipem robuſtam exciperet niſi dilataretur. Hawkenſius ſolo conductore, cujus margo dexter in aciem aſſurgit, idem præſtat; *omnes plagam dilatant, ut calculum extrahant; dilaceretur igitur ſemper veſicæ oſtium et proſtata.*” P. 14.

“But, (continues Mr. J. Bell,) higher and better authority remains behind. Deaſe was, if I judged rightly of his talents, a ſtern and rude ſurgeon, but perfect in all the theory and practice of his art; he was not very explicit in his communications with me, but from the manner and the movement of his hand, in demonſtrating to me, rather than from what he ſaid, I conclude that he cut after the manner of Raw, making the inciſion with the right hand, while he held the ſtaff with his left. “In all the trials, (ſays Deaſe,) that I have made with the gorget on the dead ſubject, I have never found the opening into the bladder ſufficiently large for the extraction of a ſtone of a middling ſize, without a conſiderable laceration of the parts. I have frequently taken the largeſt ſized gorget, and could not find, that in the adult ſubject, I ever entirely divided the proſtate gland, if it was any way large; and in the operations that were performed here on the living ſubject, the extraction was painfully tedious, and effected with great difficulty, and in ſome caſes not at all.” See John Bell's Principles of Surgery, vol. ii. p. 173—176.

We coincide entirely with Mr. J. Bell reſpecting the dangers and diſadvantages of the cutting gorget, and could adduce ſeveral caſes where operators have committed, with this inſtrument, the moſt fatal blunders. It is alſo our conviction that many deaths, after the operation, are owing to the conſequences of the opening being, in general, too ſmall, ſo that the forceps are ſometimes introduced and withdrawn twenty times before the ſtone can be extracted, and when this is accompliſhed, it is with immenſe violence and laceration. The moſt perfect lithotomy appears to us only to admit of being done with a ſcalpel and a ſtaff; and the more we reflect on the ſubject, the more we are convinced of the excellency of Cheſelden's practice

Of ſome particular methods and inſtruments.—The ſubject of lithotomy is almoſt an endleſs one, and many ſheets of this work would be taken up by a full explanation of all the various methods. Such readers as wiſh for ſo minute and long an account, are particularly referred to Sabatier's Médecine Opératoire, tom. ii. and to Mr. John Bell's Principles of Surgery, vol. ii. May it be ſufficient in this publication to make mention of ſome of the moſt intereſting of theſe numerous propoſals, in doing which, we ſhall avail ourſelves of ſome remarks contained in an inſtructive paper inſerted in the Edinb. Med. and Surg. Journal, vol. iv. by Mr. Allan Burns, lecturer on anatomy and ſurgery, Glaſgow.

Frère Côme's method with the lithotome caché.—John de Saint Côme, of the order of Feuillans at Paris, was the inventor of a knife, concealed in a ſheath, out of which the blade ſprings, on touching a kind of lever at the ſide of the handle of the inſtrument. The diſtance to which the blade ſtarts out, may be regulated by the ſurgeon before the operation, according to the extent of the wound that he may be deſirous of making. The patient being placed as in the lateral operation with the gorget, and a ſtaff introduced, the ſurgeon, with a ſcalpel, is to begin the firſt inciſion on the left ſide of the raphe of the perineum, about ten lines in front of the anus. This cut is to be continued obliquely downwards and outwards, as far as the centre of a line extending from the anus to the inſide of the tuberoſity of the iſchium. The external inciſion is to divide the integuments of the left ſide of the perineum, the accelerator urinæ, the erector penis, the tranſverſus, and the front fibres of the levator ani. Theſe parts having been cut, the index finger of the left hand is to be introduced into the left angle of the wound, with its radial ſide downwards. The right edge of the groove of the ſtaff is to be placed between the nail and ſkin at the end of the finger. The point of the ſcalpel is to be conducted into the groove of the ſtaff along the nail, which faces the left. The index finger is now to be turned, in order that its extremity may preſs upon the point of the knife, which all along is to be held with the right hand, like a writing pen. The urethra is thus to be ſlit open to the extent of five or ſix lines. The nail of the left index finger is next to be placed in the groove of the ſtaff, and is to ſerve as a means of guiding the end of the lithotome into that groove. As ſoon as the latter object has been accompliſhed, the finger is to be withdrawn; the ſurgeon, with his left hand, is to take hold of the handle of the ſtaff; and by one ſimultaneous movement, he is to raiſe the two ends of the inſtruments together towards the ſymphiſis of the pubes, by which means the lithotome will be eaſily conducted into the bladder. The entrance of the lithotome into the cavity of this viſcus will be indicated by ceſſation of reſiſtance, and the freer iſſue of the urine. The end of this inſtrument, being in contact with the cul-de-ſac extremity of the groove of the ſtaff, muſt be diſengaged by a ſlight lateral movement. The ſtaff is now to be withdrawn. The operator, with his left thumb and index finger, is then to take hold of the lithotome, about the place where its ſheath and handle meet. He is to conduct the inſtrument under the ſymphiſis pubis, turning the edge downwards and towards the left ſide of the perineum, in the direction of the external inciſion. On preſſing a lever, the blade of the lithotome quits the ſheath, when the inſtrument is to be drawn out horizontally. Thus the proſtate and neck of the bladder are divided. The forceps are then introduced, and the operation finiſhed in the ordinary way.

The lithotome caché of Frère Côme is yet employed at the Weſtminſter hoſpital, and has been lately tried by Mr. A. Cooper. It is ſtill more commonly uſed in France. The objections, however, which have thrown diſcredit upon it, are, that from its mechaniſm, and the ſtructure of the parts about the pelvis, it is likely to wound the pudendal artery; that the bladder, if collapſed, may be injured in more than one place; and that if the knife be directed downwards too obliquely, the rectum is apt to be cut.

Apparatus altus as modified by Frère Côme and Deſchamps.—Abſolute neceſſity led to the introduction of the high operation by Franco in 1561; and the ſame cauſe occaſioned its revival, in 1658, by Frère Côme. The operation, as performed by Franco, was defective: a high inciſion was alone made into the bladder; this viſcus was opened above the pubes, below the point where the peritoneum is reflected over the abdominal muſcles: the ſtone was eaſily extracted; but as there was no dependent opening from the bladder, the urine was apt to inſinuate itſelf into the cellular membrane about the pubes, to irritate and inflame the parts, and to produce either gangrene or ſuppuration, and the formation of ſinuſes. Theſe diſadvantages led to the diſuſe of the apparatus altus, till revived and new-modelled by Frère Côme, who propoſed to open the bladder in perineo, and then, through an opening made juſt above the pubes, he introduced a ſcalpel with a button point, with which he ſlit up, for an inch or two, the linea alba; the knob on the end of the knife puſhing aſide the peritoneum. After this, he introduced, by the aperture in perineo, a ſtaff, with which he made the bladder project through the opening between the recti muſcles. This done, he cut into the front of the bladder, and either with his finger and thumb, or with a pair of forceps, he took out the ſtone. In this way he extracted from the bladder a calculus, that weighed twenty-four ounces. On this method Mr. Allan Burns remarks, that it might with propriety be adopted, were it not for the danger attendant on the double inciſion into the bladder, and the protraction of the operation by the diſſection about the perineum. Indeed, as modified by Deſchamps, who, in place of the puncture in perineo, perforates the bladder from the rectum, it has met with the approbation of Mr. Thomſon of Edinburgh, who conſiders this, on particular occaſions, to be the moſt adviſable method of operating. Mr. A. Burns thinks, however, that if the bladder be thickened and indurated, it will be impoſſible to raiſe it with the cannula above the pubes. Hence, this plan is only admiſſible, when we have reaſon to ſuppoſe that the ſtone is too large to be removed by the perineum, and that the bladder is healthy. Here the puncture from the rectum is ſimple, attended with no increaſe of the danger, allows the bladder to be elevated with the cannula, and ſecures a dependent outlet for the urine. Thus we avoid the neceſſity of any diſcharge by the wound above the pubes; we run no riſk of the urine inſinuating itſelf into the cellular membrane, no inflammation is excited, no ſinuſes are formed; conſequently, the perſon ought ſpeedily to recover. Edin. Med. and Surg. Journ. vol. iv.

Invention of ſtaffs, from which the gorget cannot ſlip.—The danger of the gorget ſlipping out of the groove of the ſtaff has been already ſufficiently commented on. Le Cat, in 1747, and ſir C. Blicke, more lately, endeavoured to obviate ſuch riſk, by propoſing to uſe ſtaffs with contracted grooves. The beak of the gorget is locked and fixed in the groove of the ſtaff, till it has arrived near the end of this latter inſtrument, where the groove has a wider conſtruction. Notwithſtanding the plauſibility of this contrivance, there are reaſons which have deterred practitioners from employing it. Few ſurgeons have been inclined to truſt to the ſort of gorget that muſt be uſed; the point of contact of the beak and body of the inſtrument being neceſſarily ſo ſmall, that on the ſlighteſt deviation from the direct line, in puſhing ſuch a gorget into the bladder, the beak breaks off, the gorget ſeparates from the ſtaff, and the ſeminal veſſels and rectum are expoſed to injury. Beſides, another objection is, that the gorget is frequently ſtopped in the groove of this kind of ſtaff, at the moſt critical period of the operation.

Methods of Le Dran, Deaſe, and Muir.—Le Dran, in 1741, publiſhed his Operations of Surgery. In this work, the author deſcribes an operation, the introduction of which has been claimed by ſeveral ſince his time. The principle of the plan alluded to was to reduce the male into the ſtate of the female urethra.

The late Mr. Deaſe of Dublin, and Mr. Muir of Glaſgow, reflecting that the great cauſe of the gorget ſlipping from the ſtaff depends upon the former being puſhed along a curved ſurface; and obſerving, that ſuch an accident ſeldom or never happens on females; have propoſed, like Le Dran, to make the male urethra reſemble the female. To accompliſh this, they introduce, as uſual, a curved grooved ſtaff into the urethra, and make the common inciſion in perineo: they then open the membranous part of the urethra; but, inſtead of now introducing the gorget, they conduct along the groove a female ſtaff, and immediately withdraw the curved one. With the left hand they take hold of the handle of the ſtraight ſtaff, and with the right introduce the gorget.

Double ſtaffs.—It is ſaid that ſome operators have experienced conſiderable difficulty in finding the groove of the ſtaff in the perineum. To facilitate this buſineſs is the principal deſign of the double ſtaff, an inſtrument which is now quite laid aſide. In fact, the trouble of cutting into the ſtaff is not great enough, to render any invention of this ſort at all important.

The firſt inſtrument for this purpoſe we find deſcribed by Deſchamps, as the invention of Jarda, a ſurgeon at Montpellier. According to Mr. A. Burns, it reſembles Earle's double ſtaff; but is more complex. It conſiſts of a curved ſtaff, intended to be introduced along the urethra into the bladder, and having connected to its handle, by means of a hinge, another ſtaff, ſhorter than the former, and ſharp at its end. When Jarda had applied the ſhort ſtaff to the perineum, he puſhed its point through the ſkin, behind the bulb of the urethra, into the groove of the long ſtaff already paſſed through this canal. This ſupplementary ſtaff, in both Jarda and Earle's inſtrument, is intended to conduct the knife into the groove of the ſtaff. But Jarda aimed at more: he wiſhed to ſecure the rectum from injury, by introducing into the anus a limb of the inſtrument, which he expected would puſh the gut aſide. By machinery, he alſo contrived to ſupport the ſcrotum. Edinb. Med. and Surg. Journal, vol. iv.

Mr. Allan Burns' method. — The plan introduced by Cheſelden, and revived by Mr. John Bell, is that which Mr. A. Burns would aſſume as the baſis of the operation; but with it he propoſes to blend Mr. Deaſe's mode.

" For more than twelve months," ſays Mr. Burns, " I have been in the habit of ſhewing ſuch an operation, which is as ſimple in its performance as the one in general uſe, is attended with leſs danger to the patient, permits of an inciſion varying in ſize according to the wiſh of the operator, and completely prevents injury of the rectum or pudic artery. To perform this operation, I introduce into the urethra a common curved ſtaff, then make the uſual inciſion into the perineum, divide fully and freely the levator ani, ſo as to expoſe the whole extent of the membranous part of the urethra, the complete extent of the proſtate gland, and a portion of the ſide of the neck of the bladder. When this part of the operation is finiſhed, I open the membranous part of the urethra, and introduce, through the ſlit, a ſtraight or female ſtaff, with which I feel the ſtone, and then withdraw the curved ſtaff. Next I feel beyond the proſtate for the inſtrument, and then perforate the coats of the bladder with a curved knife, the point of which is to be inſerted in the groove of the ſtaff. This done, I graſp the handle of the ſtaff firmly in my left hand, and with the right lay hold of the handle of the knife. Having aſcertained that the two inſtruments are in fair contact, I reſt the one hand upon the other, preſſing them together, and then, by a ſteady extraction, I pull out the knife and ſtaff together, which is preferable to drawing the knife along the ſtaff: it prevents the riſk of the one ſlipping from the other; it guards the bulb of the urethra, and every other part from injury; for, between them and the cutting inſtrument the ſtaff is interpoſed. In the introduction of the knife, however, ſome caution is neceſſary, and a clear knowledge of the relative ſituation of the parts in the pelvis is requiſite; but this information is equally neceſſary in operating with the gorget. When introducing the knife, the ſide of the blade muſt be laid flat along the fore-finger of the right hand, which is to project a little beyond the point. In this ſtate, the finger and knife are to be entered into the wound, oppoſite the tuber iſchii; but, in proportion as they paſs along, they are to be inclined forward, till at laſt, with the point of the finger, the ſtaff be felt through the coats of the bladder, a little beyond the proſtate, and rather higher than the orifice of the urethra. Here the knife is, with the finger, to be puſhed through the bladder; and when the point is fairly fixed in the groove of the ſtaff, the operation is to be finiſhed by the ſteady extraction of both inſtruments. In operating with the gorget, it is neceſſary that the bladder be more or leſs diſtended; a circumſtance, in ſome caſes, with difficulty accompliſhed, from the irritability of this viſcus. In operating with the knife, the parts can be as ſafely cut when the bladder is empty as when full; indeed, perhaps, with greater ſafety: for, when not dilated, the ſhoulder of this viſcus can more eaſily be puſhed in, ſo as to permit the finger to reach the ſtaff. Some have imagined, that the introduction of the point of the knife into the cavity of the bladder muſt be dangerous, inaſmuch as we are liable to wound the ſides, in ſearching for the groove of the ſtaff. This objection is the reſult of an inaccurate knowledge of the ſtate of the parts: for, in fact, we never grope in the bladder with the point of the knife; but, with the finger, puſh in the ſide of this viſcus into cloſe contact with the ſtaff, into the groove of which the knife enters, as ſoon as it has paſſed through the coats of the bladder. Others again have objected to this mode of operating, on the idea of its being more tedious in performance than with the gorget. This is alſo founded on a miſtaken notion. True it is, indeed, that were a ſurgeon, who has been much in the habit of operating with the gorget, to exchange it for the knife, he would undoubtedly be longer of performing the operation in the latter way: but the ſame does not hold good reſpecting thoſe who have never before operated in either mode. From all that I have ſeen, I would ſay, that the one operation may be as expeditiouſly performed as the other: but even admitting that the operation with the knife uniformly required a little longer time, ſtill I think that, if ſafer, it ought to have the preference." Edinb. Med. and Surg. Journal, vol. iv. p. 65—67.

The inſtruments, uſed by Mr. Burns, are repreſented in the ſurgical plates of this Cyclopædia.

We ſhall merely ſay, that we think that the above plan of operating is much better then the common mode of cutting for the ſtone with a gorget; nor can it be found fault with on the ground of difficulty. Notwithſtanding its merit, however, few ſeem diſpoſed to give it a fair trial; but continue the employment of that dangerous and inſufficient inſtrument, the gorget, as much as ever.

Of lithotomy, as performed with common ſcalpels, and ſome other kinds of knives.—The fact of Cheſelden having cut for the ſtone fifty-two patients in ſucceſſion, of whom all recovered, excepting two, is an invincible argument in favour of his method of operating. It may be expected, that we ſhould deſcribe the mode of executing the operation with a ſcalpel; but after the full account which we have delivered of Cheſelden's plan, this duty in reality becomes ſuperfluous. The few judicious ſurgeons of the preſent day, who have given the preference to the common ſcalpel, have all operated either after Cheſelden's ſecond or third manner. The laſt has been choſen by Mr. John Bell, and is that which was crowned with ſuch matchleſs ſucceſs in the practice of its inventor. The lateral operation, as thus executed by Cheſelden, was truly once the pride of Engliſh ſurgery, to uſe an expreſſion of that able profeſſor, Dr. J. Thomſon of Edinburgh. Other operators have preferred operating after the manner of Cheſelden's ſecond method, *viz.* by cutting from the urethra towards the bladder.

Mr. Charles Bell has propoſed the employment of a ſtaff, the groove of which, towards the extremity of the inſtrument, runs along its right ſide or edge. Operative Surgery, vol. i.

It would be a tedious and endleſs buſineſs to deſcribe all the various knives which different ſurgeons have ſuggeſted for lithotomy. The late Mr. Hunter had a particular one. Mr. Aſtley Cooper has uſed a knife, much reſembling a common diſſecting ſcalpel, but having a beak, by which it may be guided along the groove of the ſtaff. We hear that this diſtinguiſhed ſurgeon is now trying Frère Côme's lithotome caché. A much approved knife for lithotomy was ſome time ſince invented by Mr. Gibſon, and another by Mr. T. Blizard. Engravings of all theſe will be found in the ſurgical plates of this work. Our objection to theſe beaked knives is, that they are in reality gorgets.

Of lithotomy on Women.—Women ſuffer much leſs from the ſtone than men, and far leſs frequently ſtand in need of this operation. It is not, however, that their urine will not ſo eaſily produce the concretions, which are termed urinary calculi. The reaſon is altogether owing to the ſhortneſs, largeneſs, and very dilatable nature of the female urethra; circumſtances, which in general render the expulſion of the ſtone with the urine almoſt a matter of certainty. The records of ſurgery preſent us with numerous inſtances, where calculi of vaſt ſize have been ſpontaneouſly voided through the meatus urinarius, either ſuddenly without pain, or after more or leſs time and ſuffering. Heiſter mentions ſeveral well authenticated examples of this kind. Middleton has alſo related a caſe, where a ſtone, weighing four ounces, was expelled in a fit of coughing, after lodging in the paſſage a week. Collot ſpeaks of another inſtance, where a ſtone, about as large as a gooſe's egg, after lying in the meatus urinarius ſeven or eight days, and cauſing a retention of urine, was voided in a paroxyſm of pain. A remarkable caſe is related by Dr. Molineux in the early part of the Philoſophical Tranſactions: a woman voided a ſtone, "the circumference of which meaſured, the longeſt way, $7\frac{6}{15}$ inches, and round about, where it was thickeſt, $5\frac{3}{4}$ inches, its weight near $2\frac{1}{2}$ ounces troy."

Sometimes, after the paſſage of large calculi, the patient has been afflicted with an incontinence of urine; but this grievance, in general, laſts only a ſhort time.

The naturally large ſize, and dilatable nature of the female urethra, have ſuggeſted the plan of endeavouring to expand this paſſage by various means, ſo that a ſtone in the bladder may be taken out with a pair of forceps, without uſing any cutting inſtrument at all. This method was propoſed by Douglas nearly a century ago, who not only recommended ſponge for the purpoſe, but alſo dried gentian root, as being more gradual in its expanſion, and better adapted to the object.

Mr. Bromfield has given the caſe of a young girl, where he effected the dilatation by introducing into the meatus urinarius the appendicula cæci of a ſmall animal in a collapſed ſtate, and then filling it with warm water, by means of a ſyringe. The piece of gut, thus diſtended, was drawn out, in proportion as the cervix veſicæ opened, and in a few hours the dilatation was ſo far accompliſhed, that the calculus had room to paſs out. See Chirurgical Obſ. and Caſes, vol. ii. p. 276.

Mr. Thomas lately met with a caſe, where, after dilating the meatus urinarius with ſponge tent, he ſucceeded in extracting an ear-picker, which lay acroſs the neck of the bladder. The paſſage was ſo much enlarged, that the left fore-finger was moſt eaſily introduced, and, (ſays this gentleman,) "I believe, had the caſe required it, both thumb and finger would have paſſed into the bladder without the ſmalleſt difficulty."

After adverting to this caſe, and other facts proving the eaſe with which the female urethra can be dilated, Mr. Thomas remarks; "If theſe relations can be credited, and there is no reaſon why they ſhould not, I can hardly conceive any caſe, in a young and healthy female ſubject, and where the bladder is free from diſeaſe, where a very large ſtone may not be extracted, without the uſe of any other inſtrument than the forceps, the urethra having firſt been ſufficiently dilated by means of the ſponge tents. For this purpoſe, the blades of the forceps need not be ſo thick and ſtrong as thoſe commonly employed." See Medico-Chirurgical Tranſactions, vol. i. p. 123—129.

Some ſurgeons have extracted ſtones from the female bladder as follows: the patient being placed in the poſition commonly adopted in the lateral operation, a ſtraight ſtaff, with a blunt end, is introduced into the bladder through the meatus urinarius. The ſurgeon then paſſes along the groove of the inſtrument the beak of a blunt gorget, which, becoming wider towards the handle, effects a part of the neceſſary dilatation. The ſtaff being withdrawn, and the handle of the gorget taken hold of with the left hand, the right fore-finger, with the nail turned downwards, is now introduced ſlowly along the concavity of the inſtrument. When the urethra and neck of the bladder have thus been ſufficiently dilated, the finger is withdrawn, and a ſmall pair of forceps paſſed into the bladder. The gorget is now removed, and the ſtone taken hold of and extracted. See Sabatier's Med. Opératoire, tom. ii. p. 103.

Notwithſtanding theſe favourable accounts of the practice of dilating the female urethra, for the purpoſe of removing calculi from the bladder, the generality of ſurgeons prefer an inciſion. It is certain, that ſome patients have found the method inſufferably painful and tedious. But the ſtrongeſt objection to the practice has ariſen from the incontinence of urine, which occaſionally follows any great diſtenſion of the urethra and neck of the bladder. Mr. Thomas believes, however, that this unpleaſant ſymptom is quite as often a conſequence of the operation of lithotomy, as now uſually performed. Medico-Chirurgical Tranſ. vol. i. p. 127.

Lithotomy on females is much more eaſy of execution, and leſs dangerous, than the ſame operation on the male ſex. It may be done in various ways; but the ſurgeons of the preſent time conſtantly follow the mode of making the requiſite opening by dividing the urethra and neck of the bladder. A ſtraight ſtaff, or director, is introduced through the meatus urinarius; the groove is turned obliquely downwards and outwards, in a direction parallel to the ramus of the left os pubis; and a gorget, or knife, is thus conducted into the bladder, and makes the neceſſary inciſion. Some operators prefer the lithotome caché, which, after being introduced, is opened as far as is deemed proper, and then drawn out with its edge turned obliquely outwards and downwards.

The French ſurgeons Louis and Flurant were the inventors of particular biſtouries for dividing both ſides of the female urethra at once; the inſtrument of the former effected this purpoſe, in paſſing from without inwards; that of the latter in paſſing from within outwards. Flurant's biſtoury bears ſome reſemblance in principle to Frère Côme's lithotome caché, or to the cutting forceps with which Franco uſed to divide the neck of the bladder. The reaſon aſſigned for theſe biſtouries is, that they will ſerve to make a freer opening for the paſſage of large ſtones, than can be ſafely made by cutting only in one direction. At preſent, however, they are never uſed. Were the ſtone known to be very large, Sabatier ſeems to prefer the apparatus altus.

A caſe may preſent itſelf, where the poſterior part of the bladder, drawn downwards by the weight of the ſtone, might diſplace a portion of the vagina, and make it protrude at the vulva, in the form of a ſwelling. Here, there would be no doubt of the propriety of cutting into the tumour, and taking out the foreign body contained in it. Rouſſet performed ſuch an operation, and Fabricius Hildanus, in a caſe where the ſtone had partly made its way into the vagina by ulceration, enlarged the opening, and ſucceſsfully extracted the extraneous body.

M. Méry once propoſed the method of making an opening into the poſterior part of the bladder, through the vagina, after introducing a common curved ſtaff; but the apprehenſion of urinary fiſtulæ made him abandon the project.

The exiſtence of extraordinary circumſtances may always render a deviation from the common modes of operating not only juſtifiable, but abſolutely neceſſary. Thus, Tolet met with a caſe, where a woman had a prolapſus of the uterus, with which the bladder was alſo diſplaced. In the latter viſcus, ſeveral calculi were perceived. An inciſion was made into it, and the ſtones extracted, after which operation

tion the diſplaced parts were reduced, and a cure ſpeedily enſued. Sabatier's Med. Opératoire, tom. ii. p. 107.

Treatment after the operation.—Whatever method of performing lithotomy has been ſelected, the great danger afterwards is the acceſs of inflammation of the bladder, peritoneum, and parts within the pelvis and abdomen in general. This alarming diſorder is the common cauſe of the numerous deaths which follow the ordinary modes of operating. The beſt method of preventing it is, as we have repeatedly explained, to make a free and ample opening for the paſſage of the ſtone, and to avoid all manual roughneſs and violence in the operation. But ſuppoſing tenderneſs and tenſion to have begun about the hypogaſtric region, attended with a ſmall frequent pulſe, pain over the abdomen, ſickneſs, thirſt, &c. not a moment muſt be loſt; as nothing will ſave the patient but the prompt and deciſive employment of antiphlogiſtic meaſures.

This much dreaded and fatal diſorder is particularly to be expected, when the patient is of a full ſanguineous habit, when the operation has been long and difficult, when much violence has been uſed in drawing out the ſtone, or when the bladder has been bruiſed by the reiterated introduction of the forceps, whether for the purpoſe of taking out one calculus, or ſeveral, or the fragment of one that has been broken. The perilous inflammation within the abdomen, however, may come on, even when the operation has been executed in the moſt expert and eaſy manner. The moſt effectual means againſt the complaint, are copious veneſection, and placing the patient for ſome hours in a warm bath. Theſe meaſures ſhould be taken immediately when the complaint is indicated by the leaſt pain and tenſion about the lower part of the abdomen. But, beſides bleeding and the warm bath, an endeavour ſhould be made to procure ſtools by giving the oleum ricini. When the patient is removed from the bath, a bliſter, or elſe leeches and fomentations, may be applied to the hypogaſtric region.

Were we to judge from the obſervations derived from the practice which it has fallen to our lot to ſee, we ſhould ſuppoſe, that the danger of hemorrhage after lithotomy has been generally exaggerated; for out of a vaſt many operations which we have been ſpectators of, there has not been one death from loſs of blood. But as wounding the pudendal artery may happen more frequently with ſome operators, whom we have had no opportunities of noticing, we are inclined to believe, not that the danger is unjuſtly magnified, but that the particular ſurgeons whom we have ſeen operate have generally eluded it.

In order to ſtop the bleeding from the trunk of the pudendal or pudic artery, authors adviſe us to introduce into the wound a cannula wrapt round with lint, for the purpoſe of making preſſure on the wounded part of the veſſel. Boyer is ſaid to have ſuppreſſed the hemorrhage in ſeveral inſtances, by introducing deeply into the wound a large doſſil, round which is tied a ligature, the ends of which, being ſeparated, are to be forcibly tied over a ſecond doſſil. The conſtriction tends to draw outwards the firſt doſſil, at the ſame time that it propels inwards that which is more external. Richerand, Noſographie Chir. t. iii. p. 533, edit. 2.

Secondary hemorrhages ſometimes occur in old debilitated ſubjects ſeveral days after the operation, and may prove fatal. They require the ſame treatment as the foregoing bleeding, though, notwithſtanding the moſt ſkilful compreſſion, the blood will often continue to ooze from day to day, till the patient falls a victim.

Were a patient to bleed profuſely from a wound of the pudendal artery, the veſſel might be taken up and tied by a good ſurgeon, which would be a much ſafer method than compreſſion. It ſeems, that in one example, Mr. Abernethy tied the trunk of this artery, where it paſſes along the inner ſurface of the tuberoſity and ramus of the iſchium. See Medical and Phyſical Journal, vol. ix. p. 393.

The dreſſings after the lateral operation are ſuperficial, and kept on with a T bandage. As ſeparating the thighs pulls aſunder the edges of the wound in the perineum, it is alſo cuſtomary to confine them together, when the patient is put to bed by means of a garter applied juſt above the knees.

LITHOXOS. See COLAPTICE.

LITHOXYLON, in *Mineralogy*, *Woodſtone*, *Holzſtein* of Werner, a ſpecies of ſiliceous genus in the arrangement of Kirwan. Its colour is generally blackiſh, or blueiſh-grey; the former frequently paſſing into the greyiſh-black, and the latter into the greyiſh white; and this from the light reddiſh-grey, into the blood or cochenille red. Seldom ochre yellow or mountain green; ſometimes reddiſh or yellowiſh-brown. Theſe colours commonly appear together in ſpots, blotches, or ſtripes, in the ſame ſpecimen. It always manifeſts its priſtine ſtate, either by its branchy form, or its knots or roots. Its ſurface, like that of the wood from which it originates, is ſometimes rough, ſometimes uneven, ſometimes coarſely ſtreaked in the direction of its length. Its internal luſtre, 1; its tranſparency, 1.2. Its fracture conchoidal; ſometimes imperfectly, or approaching to the fine ſplintery, ſometimes ſlaty; and generally, by its interlaced fibrous ſtructure, diſcovers its origin. Its fragments 3. Often ſplintery; its hardneſs, 10; the ſpecific gravity of different ſpecimens extended, upon Mr. Kirwan's trials, from 2.045 to 2.675. It is commonly, but not always, the ſubſtance of petrified wood. It often withers by expoſure to the atmoſphere. Its tranſitions are into quartz, calcedony, and, as ſome ſay, into pitch-ſtone or opal. Kirwan's El. of Min. vol. i.

LITHOXYLUM, in *Botany*, a term uſed by Linnæus to expreſs a heterogeneous ſubſtance on marine productions, which has fructifications in impreſſed points. See GORGONIA.

LITHOZUGIA, in *Natural Hiſtory*, the name of a genus of foſſils, of the claſs of the ſcrupi, compoſed of a cryſtalline matter a little debaſed, and containing within them various extraneous bodies, as pebbles, &c.

Dr. Woodward has ranked this genus among the pebbles, becauſe of the pebbles they contain; which is by no means a ſufficient reaſon for confounding two ſuch different foſſils; the lithozugia approaching to the nature of flint.

Mercatus and other naturaliſts have called the lithozugia, *oculati lapides*; and among Engliſh lapidaries they are known by the name of *pudding-ſtones*; which ſee.

LITHUANIA, in *Geography*, a country of Europe of conſiderable extent, anciently a ſeparate duchy, and afterwards united to Poland. Its capital was Vilna or Wilna, but its principal town was Grodno. When it was governed by its own ſovereigns under the title of Great-Dukes, a rivalry ſubſiſted between this duchy and the contiguous ſtates of Ruſſia and Poland, which was the occaſion of frequent conteſts. At ſo early a period as the 11th century, the Lithuanians, deſcended from the ancient ſtock of the *Slavonians* (ſee the article LETTES,) are enumerated by Neſtor in his chronicle, under the appellative Litva, among the nations tributary to the Ruſſian monarchy; nor could they find means to render themſelves an independent nation, till the time when dangerous inteſtine diviſions ſprang up in Ruſſia, under the ſucceſſors of Vladimir the Great, who died in the year 1015. At this time they were freed from the Ruſſian ſupremacy, enlarged their borders at the expence of their former maſters, and at length grew to be formidable to all their neighbours. In the year 1386, the great duke Ladiſlaus Jaghellon, or Yaghello, having eſpouſed the Poliſh queen Hadevige, and embraced the Chriſtian religion, was raiſed to the Poliſh throne, and reigned over both Poland and Lithuania. In conſequence of the union of the two countries, the conquered Ruſſian provinces devolved to this united kingdom. Ladiſlaus manifeſted the reality of his converſion, by endeavouring to propagate the Chriſtian doctrines among his idolatrous ſubjects in Lithuania; accordingly he cut down the hallowed groves, deſtroyed the oracular ſhrine, extinguiſhed the ſacred fire, and ſlew the ſerpents that were worſhipped as gods by his ſuperſtitious ſubjects. A belief univerſally prevailed among the people, that whoever profanely attempted to deſtroy theſe objects of their worſhip, would be ſtruck with inſtantaneous death; but the falſity of this tradition was evinced by the impunity of thoſe who were concerned in the ſuppoſed ſacrilege. The Lithuanians flocked in ſuch crowds to be converted, that the prieſts could only confer ſeparate baptiſm on perſons of diſtinction; but diſtributed the multitude in ranks, and ſprinkling them with water, gave one Chriſtian name to each rank without diſtinction of ſex. Ladiſlaus, having thus introduced the Chriſtian religion into Lithuania, nominated his brother Caſimir Skirgello governor of the duchy, and returned to Poland; but a civil war being excited by the ambition of Alexander, ſurnamed Vitoldus, and by the diſcontents of the people, ſtill attached to their Pagan rites, Lithuania was for ſome time a ſcene of tumult and hoſtility. At length, by a compromiſe in 1392, Vitoldus was appointed great duke, and Ladiſlaus contented himſelf with a nominal ſovereignty. In 1401 the nobles of Lithuania aſſembled at Vilna, and entered into an offenſive and defenſive alliance with the king and republic of Poland. In 1413, it was ſtipulated in a diet of Poles and Lithuanians, held in the town of Hrodlo, that, upon the demiſe of Vitoldus, the Lithuanians ſhould acknowledge no other great duke but the perſon who ſhould be appointed by the king, and with the agreement of the two nations; that if Ladiſlaus died without iſſue, the Poles ſhould elect no king without the conſent of Vitoldus and the Lithuanians, and that a diet, compoſed of repreſentatives from both nations, ſhould meet at Lublin or Panzow. From the demiſe of Vitoldus, who expired in 1439, in the 80th year of his age, the great dukes were ſometimes, in conformity to this compact, nominated by the kings of Poland, at other times in violation of it by the Lithuanians. At length Sigiſmund I. fortunately united in his perſon the two ſovereignties, and was ſucceeded in both by his ſon Sigiſmund Auguſtus. The connection between the two nations was, however, more an alliance than an union; but Sigiſmund Auguſtus having no children, and being the only ſurviving male heir of the Jaghellon family, planned the union of Poland and Lithuania, leſt upon his deceaſe the two nations ſhould again be governed by different princes. For this purpoſe a general diet was held at Lublin in 1569; and upon the ratification of the union, Sigiſmund Auguſtus renounced all hereditary right to Lithuania. From this time the ſame perſon was uniformly elected king of Poland and great duke of Lithuania, and the two nations were incorporated into one republic. Since this period, Lithuania has ſhared the fortunes of Poland; and with the gradual extinction of it, has likewiſe fallen a prey to her ſtronger and more powerful neighbours. At the partition of the year 1773, Lithuania furniſhed the whole ſhare which Ruſſia at that time obtained, and out of which the preſent vice-royalties of Mohilef and Polotſk are formed. In the ſubſequent partition of the year 1793, this grand duchy again loſt 1731 ſquare miles, and 850,000 ſouls, which now belong to the vice-royalty of Minſk; and in the final partition of the year 1795, the laſt remains of Lithuania alſo fell to the Ruſſian empire, of which at preſent the vice-royalties of Vilna and Slonimſk are formed. Theſe provinces of the Ruſſian empire are therefore thoſe in which Lithuanians reſide; but the number of people of which this nation conſiſts, can hardly be given with any degree of accuracy, as they are every where mingled with Ruſſians and Poles.

Lithuania was formerly a very woody country, but the greateſt part of it was uncultivated. However, under the tranquil reigns of Sigiſmund I. and his ſucceſſors, the woods were cleared in a great degree, and agriculture was encouraged. Pot-aſhes and wood-aſhes are made here in great abundance, and the country produces much corn. It alſo yields a great quantity of honey, from which are made the liquors called Lippitz, Mallinieck, and Mead. Its meadows and paſtures are fertile, and ſupply food for numerous flocks and herds. The wool is very fine. The lakes abound with fiſh; and the foreſts are the haunts of bears, wolves, wild boars, buffaloes, deer, and large flights of woodcocks. All ſorts of proviſions are cheap, but caſh is ſo ſcarce, that 10 *per cent.* is the common intereſt for money. The common people are generally vaſſals, and the nobility are numerous, but poor; ſome of the principal of them excepted, who poſſeſs princely revenues, occupy the chief poſts in the country, and live in great pomp and ſplendour.

LITHUANIA, *Little*, or *Pruſſian*, a province of Pruſſia, about 100 miles in length and half as much in breadth. This country was anciently over-run with thickets and woods; and in the year 1710, it was almoſt depopulated by a peſtilence. In 1720, Frederick William, at a great expence, induced many Switzers, French Proteſtants, Palatines and Franconians to ſettle here, and in 1732, 350,000 dollars were diſtributed among a freſh colony of 12,500 Saltzburgers. Theſe emigrants changed the face of the almoſt deſolated country, and its fertility appeared in the multitude and variety of its productions; ſuch as corn, horned cattle, numerous flocks of ſheep, excellent horſes, butter, cheeſe, &c. It afforded likewiſe plenty of fiſh and game. Several manufactures are alſo eſtabliſhed here, for coarſe and fine cloth, leather, &c. The ancient inhabitants of this country have a language peculiar to themſelves, into which the bible and ſome religious books have been lately tranſlated. The coloniſts of this country are engaged in various employments, to which their diſpoſition and habits incline them; and with reſpect to religion, the Switzers, French, and Franconians, are Calviniſts; ſo that there are 10 German and French reformed pariſhes, as they are denominated, in Little Lithuania. The reſt are Lutherans, intermixed with a few Papiſts. The principal towns are Memel, Tilſit, Ragnit, and Iſterburg.

LITIZ, or LEDITZ, a town, or rather village, of America, in Lancaſter county, Pennſylvania; ſituated in the townſhip of Warwick, containing about 50 houſes, and an elegant church with a ſteeple and bell, ſettled in 1757, and inhabited by the United Brethren, amounting, in 1787, to upwards of 300; eight miles N. of Lancaſter.

LITMUS, or LACMUS, in the *Arts*, is a blue pigment, or violet red paſte, formed from *archil*, which ſee. It is brought from Holland at a cheap rate; but may be prepared by adding quick-lime, and purified urine, or ſpirit of urine diſtilled from lime, to the archil previouſly bruiſed by grinding. The mixture, having cooled, and the fluid ſuffered to evaporate, becomes a maſs of the conſiſtence of a paſte, a paſte, which is laid on boards to dry, in ſquare lumps. The following is given as the exact proceſs for preparing it. (Nicholſon's Journal, 4to. vol. ii.) The lichen is firſt dried, cleanſed, and pulveriſed, in a mill like the oil-mill. The powder is then thrown into a trough, with one-half its weight of pearl-aſh, and moiſtened with a little human urine, and allowed to ferment. This fermentation is kept up for ſome time, by ſucceſſive additions of urine, till the colour of the materials changes firſt to red, then to blue. In this ſtate it is mixed with a third its weight of very good potaſh, and ſpread upon deep wooden trays till dry. A quantity of chalk is added at laſt, apparently for the mere purpoſe of increaſing the weight. It is only uſed in miniature paintings, and cannot be well depended on, becauſe the leaſt approach of acid changes it inſtantly from blue to red. This property renders the colour a valuable tint to the chemiſt, in detecting the preſence of uncombined acids. But when reddened by an acid, the blue is reſtored by an alkali: ſo that litmus may thus become a teſt both of acid and of alkali. The beſt litmus is very apt to change and fly. It is much employed for the purpoſe of giving a gloſs or finiſh to the more deep and permanent colours, by the dyers of ſilk, ſtuffs, and ribbons. Marble ſoaked with litmus-liquor imbibes it in ſome days, and becomes beautifully tinged with a colour, which will remain for a conſiderable time unimpaired.

LITOTES, Διτοτης, in *Rhetoric*. See LIPTOTES.

LITOWISCH, in *Geography*, a town of Poland, in Volhynia; 56 miles S.W. of Lucko.

LITRA, in *Ancient Coinage*. See LIBRA.

LITRE, or *Cubic Decimetre*, a French meaſure of capacity, equal to 60.02800 Engliſh cubic inches, or nearly $2\frac{1}{8}$ wine pints. See MEASURE.

LITRON, a meaſure for corn and dry commodities, in the old ſyſtem of France; 16 litrons being equal to a boiſſeau, each boiſſeau being = 780 Engliſh cubic inches, and 11 boiſſeaux = 4 Engliſh buſhels.

LITROTOND, in *Geography*, a town of Aſiatic Turkey, on the ſouth-weſt coaſt of Natolia. N. lat. 36° 51′. E. long. 27° 35′.

LITSCHAU, a town of Auſtria; 70 miles N.W. of Vienna. N. lat. 49° 48′. E. long. 14° 55′.

LITTAU, a town of Moravia, in the circle of Olmutz; 8 miles N.N.E. of Olmutz. N. lat. 49° 28′. E. long. 16° 59′.

LITTER, LECTICA, a kind of vehicle borne upon ſhafts, anciently eſteemed the moſt eaſy and genteel way of carriage.

Du Cange derives the word from the barbarous Latin, *lecteria*, *ſtraw* or *bedding for beaſts*. Others will rather have it come from *lectus*, *bed*, there being ordinarily a quilt and a pillow to a litter; in the ſame manner as to a bed.

Pliny calls the litter the traveller's chamber; it was much in uſe among the the Romans, among whom it was borne by ſlaves kept for that purpoſe; as it ſtill continues to be in the Eaſt, where it is called a *palanquin*.

The Roman *lectica*, made to be borne by four men, was called *tetraphorum*; that borne by ſix, *hexaphorum*; and that borne by eight, *octophorum*.

The invention of litters, according to Cicero, was owing to the kings of Bithynia: in the time of Tiberius they were become very frequent at Rome, as appears from Seneca; and even ſlaves themſelves were borne in them, though never by more than two perſons, whereas men of quality had ſix or eight.

LITTER, in *Agriculture*, a name applied to ſtraw, fern, or other dry ſubſtances, that are placed under horſes, cattle, &c. in the ſtables, cow-houſes, farm-yards, or other places for the purpoſe of keeping the animals clean, and the providing a large ſupply of manure. In this laſt view, all ſorts of dry materials ſhould be carefully collected, and ſtacked up for winter uſe. And it is of vaſt importance, in different views, to have it properly employed in foddering the cattle, as well as in littering them down in the ſtall and yards; as, without proper economy, much diſadvantage may ariſe to the farmer in the way of converting it into manure. See SOILING and FARM-YARD.

Merely as litter, wheat-ſtraw is always to be preferred for horſes; but for cattle and other animals, the other ſort of ſtraw, fern, &c. may anſwer equally well.

LITTERMORE, in *Geography*, an iſland on the coaſt of the county of Galway, Ireland. It is on the ſouth-eaſt of Kilkerran bay, and is about four miles long by two wide. N. lat. 53° 17′. W. long. 9° 40′.

LITTLE ALGONQUINS, Indians who inhabit near the Three Rivers, and can raiſe about 100 warriors.

LITTLE *Bairam*. See BAIRAM.

LITTLE *Britain*, a poſt-town of America, in Orange county, New York; 294 miles from Waſhington.—Alſo, a townſhip in Lancaſter county, Pennſylvania, containing 1365 inhabitants.—Alſo, a townſhip in Cheſter county, in the ſame ſtate,

LITTLE *Capſtan*. See CAPSTAN.

LITTLE *Compton*, in *Geography*, a townſhip in Newport county, Rhode iſland, containing 1577 inhabitants, and affording greater quantities of meat, butter, cheeſe, vegetables, &c. than any other town of its ſize. The inhabitants, who are induſtrious, manufacture linen and tow cloth, flannels, &c. of an excellent quality, and in conſiderable quantities for ſale.

LITTLE *Creek*, a town of America, in Kent county, Delaware, containing 1908 inhabitants.—Alſo, a town in Suſſex county, Delaware, containing 2164 inhabitants.

LITTLE *Harbour*. See PISCATAQUA.—Alſo, a bay in the ſtraits of Magellan, on the coaſt of Patagonia; 5 miles N.W. of Bachelor's river.

LITTLE *Iſland*, or *Little Salvador*, one of the ſmaller Bahama iſlands. N. lat. 23° 46′. W. long. 75° 26′.—Alſo, an iſland in the river Lee, in Ireland, about three miles in circumference; 6 miles E. of Cork.

LITTLE *Maſs*. See MASS.

LITTLE *River*, in *Geography*, a beautiful and rapid river of America, in Georgia, which, at its confluence with Savannah river, is about 50 yards wide.—Alſo, a river which partly ſeparates North and South Carolina.—Alſo, a plantation in Kennebeck county, Maine.

LITTLE *Sodus*, a harbour of lake Ontario; 15 miles S. of Oſwego.

LITTLEBOROUGH, a town on the weſt coaſt of the iſland of Nevis; 2 miles N. of Charleſtown.

LITTLETON, ADAM, in *Biography*, a learned philologiſt, was born in 1627 at Hales-Owen, in Shropſhire, of which place his father was vicar. He was educated at Weſtminſter, under Dr. Buſby; and in 1644 was admitted a ſtudent of Chriſt's college, Oxford. He was, on account of his principles, ejected by the parliamentary viſitors in 1648, and was under the neceſſity of obtaining a living as uſher at different ſchools. At the reſtoration, he was appointed ſecond maſter of Weſtminſter ſchool, king's chaplain in ordinary; and in 1674, having already obtained his doctor's degree, he was inducted to the rectory of Chelſea. This preferment was followed by being appointed a prebendary of Weſtminſter, and afterwards ſub-dean. He died on the 30th of June 1694, leaving behind him the character of an amiable man, and very conſiderable ſcholar. He was converſant in the Hebrew, Chaldaic, and Arabic languages; and was converſant with the higher parts of mathematics. He publiſhed many works in divinity and philology, but is chiefly known for his "Latin Dictionary," which was in general uſe in our ſchools till that of Ainſworth was publiſhed. He had received a grant of king Charles II. to ſucceed Dr. Buſby, as head meaſter of Weſtminſter ſchool; but death prevented the execution of the king's intention.

Littleton, *Sir* **Thomas**, an Engliſh lawyer and judge, who flouriſhed in the fifteenth century, was eldeſt ſon of Thomas Weſtcote, eſq. of Devonſhire, by the heireſs of Littleton, of Frankley in Worceſterſhire, whoſe name he aſſumed. He was regularly educated for the law; and, in the reign of Henry VI., he was made judge of the marſhalſea court and king's ſerjeant, and in 1455 went the northern circuit as judge of the aſſiſe. In 1466 he was appointed one of the judges of the common pleas, and, a ſhort time after, was created a knight of the Bath. He died in 1481, leaving three ſons, from whom many conſiderable families are deſcended. He was author of a valuable work, entitled "Tenures and Titles by which Eſtates were anciently held in England." It was written in French, and a tranſlation of it, with a commentary, forms the firſt book of Coke's "Inſtitutes." Sir Thomas, during the troubles and confuſions of the times, ſo comported himſelf, as to enjoy the favour of both the contending ſovereigns; and, at the ſame time, acquired the eſteem of all, for his great ſkill in the laws of England.

Littleton, Edward, diſtinguiſhed for his great knowledge in the common law, ſon of ſir Edward, a Welſh judge, was born in 1589, and purſued his college exerciſes in Chriſt church, Oxford, from whence he removed to the Inner Temple, to purſue the ſtudy of the law. He was an active member of parliament in the year 1628, and, together with ſir Edward Coke and ſir Dudley Digges, carried up the Petition of Right from the Commons to the Lords. He was alſo a leading manager in the accuſation againſt the duke of Buckingham, in which his judicious conduct obtained for him the good opinion of the prince and people. He ſucceeded his father as Welſh judge, and was choſen recorder of London. In 1634 he was made by Charles I. ſolicitor-general, and knighted; in 1639 he was ſworn lord chief juſtice of the common pleas; and, in the following year, he was advanced to be lord keeper of the great ſeal of England, and called to the houſe of peers by the title of lord Littleton. He afterwards loſt the favour of the king, though it is believed without reaſon, which he could never after regain. He died in Auguſt 1645, at Oxford, where he was buried on the north ſide of the choir in the cathedral of Chriſt church, and had a funeral oration pronounced over him by Dr. Henry Hammond. He publiſhed a book of Reports of Caſes in the Courts of Common Pleas and Exchequer, from the ſecond to the eighth of Charles I.; ſome ſpeeches in parliament, ſeveral arguments and diſcourſes. Biog. Brit.

Littleton, in *Geography*, a poſt-town of America, in Middleſex county, Maſſachuſetts, 28 miles N.W. of Boſton; containing 904 inhabitants.—Alſo, a poſt-town in Grafton county, New Hampſhire, incorporated in 1784, and containing 381 inhabitants.—Alſo, a townſhip, now called *Waterford*, in Caledonia county, Vermont, on the weſt ſide of Connecticut river, containing 565 inhabitants.

Littleton's *Iſland*, a ſmall iſland in the Florida ſtream. N. lat. 24° 42′. W. long. 81° 40′.

LITTORAL Shells, among writers of *Natural Hiſtory*, are ſuch ſea-ſhells as are always found near the ſhores, and never far off in the deep.

Thoſe which are found in the bottom of the ſea, remote from the ſhore, are called *pelagian*.

LITTORELLA, in *Botany*, the diminutive of *littus*, a ſhore, this plant being generally found in the neighbourhood of lakes or pools. Indeed its Engliſh name, Shore-weed, is alſo expreſſive of its place of growth. Linn. Mant. 160. Schreb. 629. Willd. Sp. Pl. v. 4. 330. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 1011. Ait. Hort. Kew. ed. 1. v. 3. 335. Juſſ. 90. Lamarck Illuſtr. t. 758.—Claſs and order, *Monoecia Tetrandria*. Nat. Ord. *Plantagines*, Juſſ.

Gen. Ch. Male, *Cal.* Perianth of four leaves, erect. *Cor.* of one petal; tube the length of the calyx; limb four-cleft, erect, permanent. *Stam.* Filaments four, thread-ſhaped, very long, inſerted into the receptacle; anthers heart-ſhaped.

Female on the ſame plant. *Cal.* none. *Cor.* of one petal, conical, permanent, its mouth unequally three-cleft. *Piſt.* Germen oblong; ſtyle thread-ſhaped, very long; ſtigma acute. *Peric.* none, except the permanent corolla. *Seed* a nut of one cell.

Eſſ. Ch. Male, Calyx four-leaved. Corolla of one petal, four-cleft. Stamens very long.

Female, Calyx none. Corolla of one petal, unequally three-cleft. Style thread-like, very long. Nut of one cell.

1. L. *lacuſtris*. Plantain Shore-weed. Linn. Mant. 295. Sm. Fl. Brit. 1011. Engl. Bot. t. 468. (Plantago uniflora; Linn. Sp. Pl. 167. Fl. Dan. t. 170.)—A native of the ſhores of lakes in various parts of Europe, and of marſhy ſandy ſpots in Great Britain, but not very common. It flowers in June. *Root* perennial, ſpindle-ſhaped. *Herb* ſmooth, ſtemleſs. *Leaves* linear, entire, convex underneath. *Male flowers* on ſtalks, ſolitary, erect, whitiſh, reſembling thoſe of Plantain: *female ones* radical, ſeſſile, having an erect, prominent, thread-ſhaped ſtyle.

The whole habit of this curious genus is that of a *Plantago*, from which however it is ſufficiently diſtinct on account of its fruit being a ſingle ſeed or nut. It was originally ſeparated from that genus, by Bergius, in the Stockholm Tranſactions for 1768. The Rev. Mr. Williams of Shropſhire has found this plant occaſionally to vary with hairy leaves.

LITURGY, denotes all the ceremonies in general belonging to divine ſervice.

The word comes from the Greek λειτουργια, *ſervice, public miniſtry*, formed of λειτος, *public*, and εργον, *work*.

In a more reſtrained ſignification, liturgy is uſed among the Romaniſts to ſignify the maſs; and among us the common-prayer.

All who have written on liturgies agree, that in the primitive days, divine ſervice was extremely ſimple, only clogged with very few ceremonies, and conſiſting of but a ſmall number of prayers; but, by degrees, they increaſed the number of external ceremonies, and added new prayers, to make the office look more awful and venerable to the people. At length things were carried to ſuch a pitch, that regulation became neceſſary; and it was found proper to put the ſervice, and the manner of performing it, into writing; and this was what they called a liturgy.

Liturgies have been different at different times, and in different countries. We have the liturgy of St. Chryſoſtom, that of St. Peter, of St. James, the liturgy of St. Baſil, the Armenian liturgy, the liturgy of the Maronites, of the Cophtæ, the Roman liturgy, the Gallican liturgy, the

Engliſh liturgy, the Ambroſian liturgy, the Spaniſh and African liturgies, &c.

In the more early ages of the church, every biſhop had a power to form a liturgy for his own dioceſe; and if he kept to the analogy of faith and doctrine, all circumſtances were left to his own diſcretion. Afterwards the practice was for the whole province to follow the ſervice of the metropolitan church, which alſo became the general rule of the church: and this Lindwood acknowledges to be the common law of the church; intimating, that the uſe of ſeveral ſervices in the ſame province, which was the caſe in England, was not to be warranted but by long cuſtom. Gibſ. 259.

The liturgy of the church of England was compoſed in the year 1547, and eſtabliſhed in the 2d year of king Edward VI. by ſtat. 2 & 3 Edw. VI. cap. 1.

In the fifth year of this king it was reviewed; becauſe ſome things were contained in that liturgy, which ſhewed a compliance with the ſuperſtition of thoſe times, and ſome exceptions were taken againſt it by ſome learned men at home, and by Calvin abroad. Martin Bucer was conſulted, and ſome alterations were made in it, which conſiſted in adding the general confeſſion and abſolution, and the communion to begin with the ten commandments. The uſe of oil in confirmation, and extreme unction were left out, and alſo prayers for ſouls departed, and what tended to a belief of Chriſt's real preſence in the euchariſt. This liturgy, ſo reformed, was eſtabliſhed by the act of 5 & 6 Edw. VI. cap. 1. However, it was aboliſhed by queen Mary, who enacted that the ſervice ſhould ſtand as it was moſt commonly uſed in the laſt year of the reign of king Henry VIII. The liturgy of 5 & 6 Edw. VI. was re-eſtabliſhed with ſome few alterations and additions, by 1 Eliz. cap. 2. All the biſhops preſent diſſented both in this and the former acts; and, therefore, the expreſſion "lords ſpiritual" doth not occur in either of them. (Gibſ. 268.) Some farther alterations were introduced, in conſequence of the review of the Common Prayer Book, by order of king James, in the firſt year of his reign; particularly in the office of private baptiſm, in ſeveral rubricks and other paſſages, with the addition of five or ſix new prayers and thankſgivings, and all that part of the catechiſm which contains the doctrine of the ſacraments. The book of Common Prayer, ſo altered, remained in force from the firſt year of king James to the fourteenth of Charles II. But the laſt review of the liturgy was in the year 1661, and the laſt act of uniformity enjoining the obſervance of it, is 13 & 14 Car. II. cap. 4. (See Common *Prayer*.) Many applications have been ſince made for a review, but hitherto without ſucceſs. See Free and Candid Diſquiſitions relating to the Church of England, &c. 8vo. Lond. 1749.

We ſhall here ſubjoin ſome pertinent remarks on liturgies by archdeacon Paley, together with ſome additional reflections. Liturgies, or preconcerted forms of public devotion, being neither enjoined in ſcripture, nor forbidden, there can be no good reaſon for receiving or rejecting them, but that of expediency; which expediency is to be deduced from a compariſon of the advantages and diſadvantages attending this mode of worſhip with thoſe which uſually accompany extemporary prayer. The advantages of a liturgy are theſe: 1. That it prevents abſurd, extravagant, or impious addreſſes to God, which, in an order of men ſo numerous as the ſacerdotal, the folly and enthuſiaſm of many muſt always be in danger of producing, where the conduct of the public worſhip is entruſted, without reſtraint or aſſiſtance, to the diſcretion and abilities of the officiating miniſter. On the other hand, the advocate for free prayer might allege, that the caſes to which the ingenious author refers are of the extreme kind, that are not likely often to occur; that a miniſter who is capable of addreſſing a congregation acceptably and uſefully, would not be in danger of offending in the manner here ſuppoſed, when he conducted their ſocial devotion, more eſpecially as he would conceive it to be his duty to make previous preparation for the one ſervice as well as the other; that the mode of performing public worſhip muſt be left to the choice and approbation of thoſe who concur in it; that the occaſional perverſion and abuſe of a privilege cannot be juſtly pleaded againſt the uſe of it; and that if the evil were greater than it is, there is no method of avoiding it, but by the impoſition of preconcerted liturgies, which would encroach on liberty in the province of religion. Eſtabliſhed liturgies, it might be ſaid, are not eaſily accommodated to the ſentiments of the worſhipper, who diſbelieves the creed on which they are founded; and they muſt lead him to the avowal of principles, and to the uſe of language, which his judgment diſapproves. If every officiating miniſter be allowed to adopt his own mode of conducting ſocial worſhip, whether it be by extempore prayer, or by forms, for each of which he has made previous preparation, he is not likely to give offence to thoſe who join with him.

Our author further obſerves, 2. That a liturgy prevents the *confuſion* of extempore prayer, in which the congregation being ignorant of each petition before they hear it, and having little or no time to join in it after they have heard it, are confounded by their attention to the miniſter, and to their own devotion. The devotion of the hearer is neceſſarily ſuſpended, until a petition be concluded; and before he can aſſent to it, or properly adopt it, that is, before he can addreſs the ſame requeſt to God for himſelf, and from himſelf, his attention is called off to keep pace with what ſucceeds. But the advocate for free prayer will naturally enquire, if this be not the caſe, in a greater or leſs degree, in every continued ſervice? If he has the words before him, which he uſes in his devotion, does he dwell on a ſingle ſentence as ſoon as the officiating miniſter utters it? Is not his attention drawn on to ſucceeding parts of the prayer that is pronounced, as ſoon as they are delivered? But in neither caſe is his mind kept long in a ſtate of ſuſpence; and he has this advantage, that whilſt he is joining in exerciſes of devotion with the miniſter of his choice, he is not likely to heſitate in concurring with him. As to the novelty with which he expects to be gratified, this may probably be more likely to excite his attention and impreſs his heart, than a recurrence of ſentiments and expreſſions that are familiar to him, and which long-continued uſe will prevent from intereſting and fixing the (perhaps) wandering mind. *Joint* prayer, it is further ſaid by the learned archdeacon, which, among all denominations of Chriſtians, is the declared deſign of "coming together," is prayer in which all *join*; and not that which one alone in the congregation conceives and delivers, and of which the reſt are merely hearers. This objection, ſays our author, ſeems fundamental, and holds even where the miniſter's office is diſcharged with every poſſible advantage and accompliſhment. But in the uſe of preconcerted and eſtabliſhed liturgies, are not all beſides the officiating miniſter hearers, unleſs they concur in thoſe reſponſes, which have been obſerved in many inſtances to produce confuſion, and to render devotion a kind of mechanical buſineſs? The advocate for extempore prayer will allege, that he is not leſs capable of joining in a worſhip, conducted by a miniſter who uſes words, ſuggeſted at the moment, than in that which is performed by a recital of words previouſly written or printed. The objection to this mode of public worſhip, founded on the labouring recollection, and embarraſſed or tumultuous delivery of many extempore ſpeakers, evinces the neceſſity of talents for the diſcharge of this part of public duty, and of previous preparation, but does not prove that the adoption of a liturgy is either moſt expedient or moſt uſeful when extempore prayer is properly performed ; and it is preſumed, that perſons who are accuſtomed to exerciſes of devotion will acquire a facility in the performance of them, which will, in a great degree, obviate the objection now ſtated, and prevent the pain that would be given to the ſerious part of a congregation, or the profane diverſion which might be occaſioned by the levity of the other part.

The advantages of a liturgy, our author candidly allows, are connected with two principal inconveniences ; *firſt*, that forms of prayer compoſed in one age become unfit for another by the unavoidable change of language, circumſtances and opinions : *ſecondly*, that the perpetual repetition of the ſame form of words produces wearineſs and inattentiveneſs in the congregation. Both theſe inconveniences, however, are in their nature vincible. Occaſional reviſions of a liturgy may obviate the firſt, and devotion will ſupply a remedy for the ſecond ; or, as our author thinks, they may both ſubſiſt in a conſiderable degree, and yet be outweighed by the objections which are inſeparable from extemporary prayer. Nevertheleſs, this is a conceſſion, which will not be admitted by the advocates of the latter mode of worſhip ; nor adverting to paſt experience, ſince the year 1661, will they lay much ſtreſs on occaſional reviews of the liturgy.

How far the Lord's prayer is a precedent, as well as a pattern, for forms of prayer, is a queſtion, concerning which writers, who have directed their attention to this ſubject, are not agreed.

Archdeacon Paley ſpecifies the following properties as requiſite in a public liturgy ; *viz.* that it be compendious ; that it expreſs juſt conceptions of the divine attributes ; that it recite ſuch wants as a congregation are likely to feel, and no other ; and that it contain as few controverted propoſitions as poſſible. As to the firſt property, he obſerves, that it would be no difficult taſk to contract the liturgies of moſt churches into half their preſent compaſs ; and yet retain every diſtinct petition, as well as the ſubſtance of every ſentiment, which can be found in them. Although our author does not admit the propriety of ſtudying brevity too much, he is of opinion, that the too great length of church ſervices is unfavourable to piety. It begets in many an early and unconquerable diſlike to the public worſhip of their country or communion. They come to church ſeldom ; and enter the doors when they do come under the apprehenſion of a tedious attendance, which they prepare for at firſt, or ſoon after relieve, by compoſing themſelves to a drowſy forgetfulneſs of the place and duty, or by ſending abroad their thoughts in ſearch of more amuſing occupation. Although there may be ſome few of a diſpoſition not to be wearied with religious exerciſes, yet, where a ritual is prolix, and the celebration of divine ſervice long, no effect is in general to be looked for, but that indolence will find in it an excuſe, and piety be diſconcerted by impatience. It might further be obſerved, that the extent of our eſtabliſhed liturgy does not leave time ſufficient for public inſtruction ; that the attention is fatigued before this part of our public ſervice commences ; and that exceſs in our public diſcourſes, which admit of variety, is more excuſable than the ſame fault in our devotional exerciſes, during which the attention ought to be kept alive, and the underſtanding and heart properly engaged. Our author remarks, that the length and repetitions complained of in our liturgy are not ſo much the fault of the compilers, as the effect of uniting into *one* ſervice, what was originally, but with very little regard to the conveniency of the people, diſtributed into *three*. Accordingly we obſerve, with the authors of the "Free and candid Diſquiſitions," that the Lord's prayer in particular is enjoined to be publicly uſed every Lord's day in our ordinary ſervice, when there is no communion, no leſs than ſeven times, *viz.* five times in the morning and twice in the afternoon : and when there is a communion, and alſo afternoon ſermon or lecture, then nine times : and if the office of infant baptiſm (to ſay nothing of that of adults), and the other of churching of women, happen to come in, as they may and do ſometimes, both morning and afternoon, then thirteen times. The "Gloria Patri" is introduced commonly, and moſt uſually, ſeven or eight times ; not unfrequently nine or ten ; and may alſo occur eleven times, in the courſe of our morning ſervice only. Notwithſtanding that dread of innovation, in religion, which, ſays archdeacon Paley, ſeems to have become the *panic* of the age, few, as he ſuppoſes, would be diſpleaſed with ſuch omiſſions, abridgments, or change in the arrangement, as the combination of ſeparate ſervices muſt neceſſarily require, even ſuppoſing each to have been faultleſs in itſelf. If, together with theſe alterations, the epiſtles and goſpels, and collects which precede them, were compoſed and ſelected with more regard to unity of ſubject and deſign ; and the pſalms and leſſons either left to the choice of the miniſter, or better accommodated to the capacity of the audience, and the edification of modern life ; the church of England would be in poſſeſſion of a liturgy, in which thoſe who aſſent to her doctrines would have little to blame, and the diſſatisfied muſt acknowledge many beauties. The ſtyle throughout is excellent ; calm, without coldneſs ; and, though every where ſedate, oftentimes affecting. The pauſes in the ſervice are diſpoſed at proper intervals ; the tranſitions from one office of devotion to another, from confeſſion to prayer, from prayer to thankſgiving, from thankſgiving to "hearing of the word," are contrived, like ſcenes in the drama, to ſupply the mind with a ſucceſſion of diverſified engagements. As much variety is introduced alſo in the form of praying as this kind of compoſition ſeems capable of admitting.

The *ſecond* property of a liturgy, *viz.* that it ſhould expreſs juſt conceptions of the divine attributes, is an article deſerving particular care. The popular notions of God are formed, in a great meaſure, from the accounts which the people receive of his nature and character in their religious aſſemblies. An error here becomes the error of multitudes : and as it is a ſubject in which almoſt every opinion leads the way to ſome practical conſequence, the purity or depravation of public manners will be affected, among other cauſes, by the truth or corruption of the public forms of worſhip. The *third* requiſite of a liturgy is that it recite ſuch wants as the congregation are likely to feel, and no other. It were therefore to be wiſhed that every part of a liturgy were perſonally applicable to every individual in the congregation ; and that nothing were introduced to interrupt the paſſion, or damp a flame which it is not eaſy to rekindle. Upon this principle, the *ſtate-prayers* in our liturgy ſhould be fewer and ſhorter. The *ſtate-ſtyle* likewiſe ſeems unſeaſonably introduced into theſe prayers, as ill according with the annihilation of human greatneſs, of which every act that carries the mind to God preſents the idea. It is required, *fourthly*, that a liturgy contain as few controverted propoſitions as poſſible. Why, ſays our author, ſhould every poſition which a church maintains be woven with ſo much induſtry into her forms of public worſhip ? Some are offended, and ſome are excluded ; this is an evil in itſelf, at leaſt to *them* : and what advantage or ſatisfaction can be derived to the *reſt* from the ſeparation of their brethren, it is difficult to imagine: unleſs it were a duty to publiſh our ſyſtem of polemic divinity, under the name of making confeſſion of our faith every time we worſhip God; or a ſin, to agree in religious exerciſes with thoſe from whom we differ in ſome religious opinions: indeed, where one man thinks it his duty conſtantly to worſhip a being whom another cannot, with the aſſent of his conſcience, permit himſelf to worſhip at all, there ſeems to be no place for comprehenſion, nor any expedient left but a quiet ſeceſſion. All other differences may be compromiſed by ſilence. If ſects and ſchiſms be an evil, they are as much to be avoided by one ſide as the other. If ſectaries are blamed for taking unneceſſary offence, eſtabliſhed churches are no leſs culpable for unneceſſarily giving it: they are bound at leaſt to produce a command, or a reaſon of equivalent utility, for ſhutting out any from their communion, by mixing with divine worſhip, doctrines which, whether true or falſe, are unconnected, in their nature, with devotion. Paley's Principles of Moral and Political Philoſophy, vol. ii. chap. 5. See Prayer.

Of all the forms which Chriſtianity has taken in different parts of the world, of all the ſects which refuſe communion, with regular eſtabliſhments, muſic, or rather chanting, has been the language of devotion. It has been ſarcaſtically aſked, whence this impulſe to *cry aloud* originated; was it from the thundering muſic of the ſingers of Joſhua round Jericho, the ſweet ſtrains of the harp of David, the pompous and proud clangor and vociferating of the myriads of muſicians at the temple of Solomon, or the pious chant of the canticle which Jeſus Chriſt and his apoſtles ſung at the firſt inſtitution of prayer, that we derive our choirs, hymns, pſalms, and ſpiritual ſongs, which in every communion of Chriſtians conſtitute, and always have conſtituted, a conſiderable part of the public worſhip regulated by liturgies? We have no doubt but that the primitive Chriſtians, when their religion was founded on that of the Jews, (at leaſt as far as the belief and worſhip of one God,) in oppoſition to Paganiſm and idolatry, ſung the Pſalms of David, which they had adopted, in imitation of the royal pſalmiſt and his nation.

But there was no Pagan temple, or ſacrifice at an altar, without muſic, and at preſent, even the ſavages of America honour their divinities with ſinging. Indeed ſongs, of which the ſubject and poetry correſpond with the rites and ceremonies of the Pagans, conſtituted all their liturgies, to the exact celebration of which it is well known they were ſcrupulouſly attached. It is true that the Chriſtians differ very much in their muſical taſtes. The Quakers have no liturgy; they wait till the ſpirit moves them to ſpeak, and never ſing; they only ſigh and groan. Calvin ſtript muſic of harmony and meaſure, and allowed of nothing but uniſonous and ſyllabic ſinging in the conventicles, without the aſſiſtance of that *box of whiſtles*, as the Scotch reformers uſed to ſtyle the organ. The modern methodiſts like light, airy, and familiar muſic ſo much better than ſolemn ſtrains of ſupplication, that they admit ballad and barrel-organ tunes out of the ſtreet to be adapted to their hymns. The muſic à cappella, in the cathedral ſervice of the Roman Catholics and Proteſtants of the ſixteenth and ſeventeenth centuries, ſeems the moſt ſolemn and reverend ſpecies of muſic with which to addreſs the divinity; at leaſt it is the moſt grateful to cultivated ears. In pariſh churches, under the guidance of a powerful organ, or a judicious chantor, pſalmody in parts, provided ſome reſpect were paid to accent, and diſtinction were made between long and ſhort ſyllables, as in the 104th pſalm and other melodies in triple-time, would ceaſe to be abſurd and ridiculous to lovers of muſic, and rendered a gratification, inſtead of a torture, to cultivated ears.

LITVINTZOVA, in *Geography*, a town of Ruſſia, in the government of Irkutſk; 36 miles S. of Ilimſk.

LITUS, in the *Materia Medica*, the ſame as *liniment*; which ſee.

LITUUS, among *Medaliſts*, the ſtaff or wand twiſted round at the top, uſed by the augurs, made in the form of a crozier, and the badge of the augurſhip.

We frequently ſee it on medals, along with other pontifical inſtruments. Aulus Gellius ſays, it was bigger in the place where it was crooked than elſewhere. In ſome coins of Nero the lituus appears at his breaſt; and from badly preſerved coins has been taken by ſome medallic writers for a ſerpent.

Lituus, in *Natural Hiſtory*, a name given to a genus of ſhells of the claſs of the polythalamii, or thoſe which conſiſt of ſeveral concamerations or chambers, parted from one another by ſhelly diaphragms, and communicating with one another by means of a ſiphunculus, which runs through the whole length of the ſhell. To this general character of the claſs, it is to be added, that the lituus is always a conic ſhell, running in a ſtraight line from the mouth, through a great part of the length, and from the end of this ſtraight part to the extremity, twiſting into the ſhape of a cornu ammonis, or ſpiral ſhell of that kind.

It is thus named from its reſembling the inſtrument called lituus among the ancients. The ſtony matter often found caſt in this ſhell, and reſembling all its lineaments, is called by authors *lituites*, as thoſe ſtones formed in the pecten, pectinites, and thoſe in the echini marini echinitæ. See Conchology.

Lituus, in *Roman Antiquity*. The Romans had a crooked military muſical inſtrument called a *lituus*, in the form of the augural ſtaff, whence it had its name. It was a ſpecies of clarion, or octave trumpet, made of metal, and extremely loud and ſhrill, uſed for the cavalry, as the ſtraight trumpet was for the foot. Horace diſtinguiſhes it from the *tuba*, or trumpet.

> "Multos caſtra juvant, et lituo tubæ
> Permiſtus ſonitus, ——— Od. i. 23.

as Claudian does from the flute:

> "Tibia *pro* lituis, et pro clangore tubarum
> Molle lyræ, fuſtumque canant."

On our muſic plates are engraved a double lituus and a ſtraight trumpet, from an ancient bas-relief in the Vitaleſchi palace at Rome, repreſenting a ſacrifice: as is a genuine ancient metalline lituus, now in the poſſeſſion of the right honourable ſir Joſeph Banks, K.B. and preſident of the Royal Society. It was found with many other antiquities, both Roman and Anglo Saxon, in clearing the bed of the river Witham, near Tatterſhall, in Lincolnſhire, 1761, and is perhaps the only inſtrument of the kind that is now extant. It is a long narrow tube, with a ſwelling curve at the end, like the double lituus, but reſembling ſtill more an inſtrument ſculptured on the baſe of Trajan's pillar at Rome. It is neatly made of very thin braſs, with three joints or pieces, like German flutes, and has been well gilt. Its length is upwards of four feet, though the upper end has been evidently broken off.

An inſtrument of this kind, made of caſt braſs, was found in digging a well, near Battle in Suſſex, and was then filled with ſmall ſhells. We have an engraving of it in Groſe's

Military Antiquities, vol. ii. A ſimilar trumpet is engraved in Montfaucon's Roman Antiquities.

This inſtrument frequently appears on ancient medals as a ſymbol of war, and is terminated with the head of a boar, and ſometimes with that of a ſnake, as on an ancient family medal of Albinus, ſtruck during the time of the republic, between the firſt Punic war and the reign of Auguſtus.

LITYERSA, the ſong of the reapers, in the *Ancient Muſic*. Theocritus, Apollodorus, Julius Pollux, Suidas, and others, mention this ſong, and call it Lityerſa, from Lytiurſas, the natural ſon of Midas; a rude and ferocious prince, who obliged ſtrangers to work with him in the fields at harveſt-time, and thoſe who were too feeble and unable to work, he put to death. Hercules killed him in the life-time of his father.

Julius Pollux ſays that this ſong was mournful, and ſung round the ſhearers, to conſole Midas for the death of his ſon.

LITZENDORF, in *Geography*, a town of Bavaria, in the biſhopric of Bamberg; 6 miles E.N.E. of Bamberg.

LIVADIA, a province of European Turkey, bounded on the N. by Theſſaly, on the E. by the Archipelago, on the S. by the gulf of Lepanto, which ſeparates it from the Morea, and the gulf of Egina, and on the W. by the Mediterranean; 180 miles long from N.W. to S.E., and about 35 miles in its medial breadth. This province comprehends what was properly called Greece (ſee GRÆCIA *Propria*); and the mountains, ſo much celebrated by the ancients, *viz.* Parnaſſus, Helicon, and Cythæron. The places that are now moſt noted in it are Lepanto, Livadia, and Athens.

LIVADIA is alſo a large, populous, commercial town, in the province of the ſame name, ſituated near the gulf of Lepanto, and built round a mountain terminating in a peak, and on which is a caſtle; 28 miles N. of Corinth. N. lat. 38° 37'. E. long. 23 54'.

LIVADOSTA, a town of Livadia, on the E. extremity of the gulf of Lepanto; 20 miles S.E. of Livadia..

LIVAROT, a town of France, in the department of the Calvados, and chief place of a canton, in the diſtrict of Liſieux; 8 miles S.S.W. of Liſieux. The place contains 1210, and the canton 11,279 inhabitants, on a territory of 195 kiliometres, in 29 communes.

LIUBIM, a town of Ruſſia, in the government of Jaroſlavl; 40 miles N.E. of Jaroſlavl. N. lat. 58° 55'. E. long. 40° 50'.

LIUBITCH, a town of Ruſſia, in the government of Tchernigov, on the Dnieper; 20 miles W. of Tchernigov. N. lat. 51° 22'. E. long. 26° 44'.

LIUDER, a town of Sweden, in the province of Smaland; 31 miles W. of Calmar.

LIVE CAVES, in *Mining*, a phraſe uſed by many people to expreſs ſuch caverns in the earth as have but little communication with the external air, and are found to abound with mineral productions. The workers in the lead-mines on Mendip-hills diſtinguiſh the numerous caverns in thoſe places into the *live* or *quick* caves, and the *dead* caves; the latter are ſuch as admit the air into them two or three ways, and are barren of any thing valuable; the others have only one paſſage, and that but narrow and winding, and generally lie at great depths. Theſe abound in numerous elegant productions. They almoſt always contain ore in ſome form or other, and uſually abound in elegant ſpars. Mr. Beaumont mentions one of theſe in the Philoſophical Tranſactions, which lay at thirty-five fathom perpendicular depth, in which there was found a fine liver-coloured earth, of the nature of bole armenic, which in many places ſhoot up in a wonderful manner in a ſort of ſpires of the height of three or four inches, formed with ridges and furrows, and uſually covered with ſpar at the top; ſometimes all the way down, to the bed of earth. Phil. Tranſ. N° 129.

LIVE *Ever*, in *Botany*. See ORPINE.

LIVE *in Idleneſs*. See VIOLET.

LIVE *Hedges*, in *Rural Economy*, ſuch as are conſtituted of living materials, ſuch as white-thorn plants, &c. See FENCE.

LIVE-*Stock*, in *Agriculture*, is a term which ſignifies all that ſort of animal ſtock which is raiſed or kept upon a farm, either for the purpoſe of uſe or profit. It comprehends all ſorts of domeſtic animals, whether thoſe of the cattle, horſe, and ſwine kinds, or thoſe of the rabbit and poultry deſcriptions. In one of the reports of the ſtate of agriculture, drawn up for the board, it is ſtated that this is a ſubject which "is, perhaps, the moſt important in the whole range of rural economics. The pooreſt and moſt backward nations contrive to raiſe bread for their conſumption, equal to the demand; and to increaſe the quantity with the increaſe of their mouths. Their wheat, in the moſt miſerable huſbandry, is nearly equal, and much of it ſuperior, to that of our highly cultivated fields; and we feel conſtantly in our markets the effect of their competition: but with all that concerns live-ſtock the caſe is abundantly different; it is by great exertions only that a people can be well ſupplied, and for want of ſuch exertions, many nations are forced to content themſelves with ſuch meat as others would not touch. Look at a ſample of French and Swiſs wheat, no difference is found; but examine the cows of Swiſſerland and Lorraine, what a difference! Compare the mares of Flanders with the ponies of Bretagne, the ſheep of England and of France: nay, let us come nearer home, and reflect on the wool in competition; examine the fleeces of Segovia and of Italy, in the ſame parallel of latitude." And it is added that, "next to the cultivation of waſte lands (which by the way much depends on the well ordering of live-ſtock), this, it is conceived, is the greateſt deſideratum in the agriculture of Britain."

And it has been remarked by the author of "Practical Agriculture," that there is ſcarcely any branch of huſbandry that is of more conſequence to the farmer, or which, of late, has been more attended to and improved. He ſuppoſes, indeed, that it might eaſily be imagined that, as the means of ſupporting domeſtic animals became more perfectly known, and more extenſively provided, great and beneficial changes would take place in the nature, form, and other properties of the animals that were to be kept for the purpoſes of the farmer, and conſequently advantages to be derived both in the amelioration of the land and the improvement of the live-ſtock, which it ſupported. It is alſo conceived, that the greatly increaſed demand for this ſort of ſtock, either for the purpoſes of food or labour, may have likewiſe had much effect in promoting and forwarding their improvement; but that, though much has lately been accompliſhed in this department of rural economy, much ſtill remains to be done, which may in ſome meaſure be effected by the judicious combination of proper improved breeds of animals of different kinds, with the various improvements in the cultivation and management of herbage or other ſorts of green food by which they are to be ſupported.

Mr. Middleton likewiſe contends that, where it is intended "to attempt any conſiderable improvement in the nature of the live-ſtock of a farm, care ſhould be previouſly taken that there is a ſufficient degree of ſhelter, ſhade, and warmth, as well as a high degree of fertility of the land, and a ſuitable

able ſtate of drainage, as it is only by the richneſs and abundance of food that ſuch changes can be effected in the moſt advantageous way, or the ſtock be brought to any high degree of perfection." The circumſtances which are to be more particularly conſidered, in undertaking improvements in the nature of live-ſtock, eſpecially in what relates to themſelves, are thoſe of the ſhape, the ſize, the diſpoſition, the hardineſs, the arriving quickly at maturity, the peculiar nature of the fleſh, the property of fattening with expedition, the affording milk in ſufficient plenty, the quality of the hide, the fitneſs for performing labour, and the particular quality or nature of the breed, of whatever ſort of animal it may be. All of which are particularly conſidered in explaining the nature and methods of management that are the moſt proper to be adopted in breeding, rearing, and bringing to perfection different ſorts of animals of the domeſtic kind for the uſes of the farmer. See BREEDING.

In reſpect to the introduction of all ſorts of live-ſtock upon a farm, the cultivator ſhould conſtantly and carefully conſider the nature and extent of his keep, or the means which he has of providing them with proper ſupplies of proper kind of food, as on this, the ſize and other properties of the animals muſt in a great meaſure depend. The idea of good keep is conſtantly neceſſary to be kept in view, as without it, little can be effected in this part of huſbandry. It has been forcibly remarked by the writer of the Staffordſhire Agricultural Report; that "all good ſtock muſt be both bred with attention and well fed; and that it is neceſſary, that theſe two eſſentials in this ſpecies of improvement ſhould always accompany each other; for without good reſources for keeping it would be in vain to attempt ſupporting a capital ſtock, and with ſuch reſources, it would be abſurd not to aim at a breed ſowewhat decent in quality." This ſort of improvement muſt, however, be much regulated by the circumſtances of the farmer, and be often only gradually effected on account of the want of money for the purpoſe of making a more full change in the ſtock of the farm.

In the Agricultural Report for Perth, it is ſtated, that, "there is one circumſtance, relative to the introduction of all new breeds, which muſt not be paſſed over in ſilence, becauſe no farmer can neglect it without a certain loſs. Every kind of paſture is fitted to raiſe animals to a particular ſize. When beaſts of a larger ſize are brought in, than the quality of the food is calculated to ſupport, theſe animals, whether cows, or horſes, or ſheep, or any other kind, will degenerate apace, and never prove uſeful, until they come down to that ſtandard or ſize adapted to their ſituation and ſuited to their food." And that, "on the other hand, when a ſmaller breed than ordinary is brought in, they continue to increaſe in bulk, until they come up to the pitch which is ſuited to their nouriſhment. But there is this remarkable difference betwixt theſe two progreſſions, in reſpect to profit, that in the retrograde progreſs, when animals are brought from rich paſture and a comfortable ſituation to the reverſe, they are in every inſtance worſe than the indigenous breed; whereas the animals, which are brought from worſe to better, continue to improve, till they arrive at that perfection, which the change in their ſituation is calculated to produce. Theſe cauſes may not immediately have their full effect; but in a few years they certainly and evidently will. He makes, for this reaſon, a much ſafer experiment, who brings cattle from worſe to better, than he who brings them from better to worſe. This reaſoning applies to all plants, as well as animals. Highland cattle riſe to a great ſize, not only by the keeping in South Britain, but in rich paſtures at home." And he adds, that it is "in vain to attempt to improve a breed of animals beyond the circumſtances of the country as to climate and paſture; while, at the ſame time, it is no eaſy matter to diſcern, without proper trials, how far theſe circumſtances can ſupport a better ſtock. Here is great room, he ſuppoſes, for the ingenious to exerciſe their judgment in improving the breeds of different animals. One ſpecies has evidently degenerated in this country, by a change in their ſituation to the worſe. The red or foreſt-deer is but a puny animal in compariſon of thoſe of former times. This will be apparent to any perſon, who compares the horns of a deer that is killed at preſent to thoſe of the ſame ſpecies, which are in different places dug out of the moſſes. The cauſe is obvious." It is therefore conceived, that "the improvement of the ſoil ought to go hand in hand with the introduction of a larger breed of cattle: and a large breed ought, for the ſame reaſon, to be introduced, in that degree, in which the ſtyle of agriculture is improved."

In ſupport of this, Mr. Middleton, in the Agricultural Report of Middleſex ſtates, that "the richeſt grazing land, and the moſt nouriſhing artificial food, will certainly pay more in feeding large bullocks, ſheep, and ſwine, than it would do in feeding the ſmaller ſizes of the ſame ſpecies," and that "it is equally obvious that the ſmaller breeds will anſwer better on the poor paſture than the large."

Further, the particular qualities which the farmer has in contemplation, is likewiſe a point which muſt be attended to in fixing upon breeds of domeſtic animals for particular farms. Conſidering the various breeds of domeſtic animals, as the machines by which the farmer is enabled to ſend his herbage and other ſorts of food to market, Mr. Donaldſon thinks he ought, by the ſtudy of every proper mean, to advance their improvement, in reſpect to form as well as the diſpoſition to fatten, that the produce of his farm may be diſpoſed of in the moſt advantageous manner; and that beſides the benefit he would derive individually, from their being thus rendered leſs tedious in the proceſs of fattening, and leſs productive of offal, the community would gain vaſt advantage in the great increaſe of animal food.

As ſoon as proper ſorts of live-ſtock have been introduced according to the particular circumſtances of the land, the farmer ſhould be extremely careful in the management of them, whether they be of the cattle, ſheep, or other kinds, in the providing them with due and full ſupplies of food, whether in the changes of paſture during the ſummer ſeaſon, or in that of other ſorts in the winter, ſo as to keep them conſtantly in a proper thriving condition; in affording them ſuitable degrees of ſhelter and warmth, and in having them properly littered down, when confined to the yards or ſtalls; and under all circumſtances well ſupplied with good water; as all theſe have much effect in promoting the improvement of the ſtock, and, of courſe, that of the advantage of the farmer: different methods are purſued in different diſtricts, with this view, in animals of different kinds, which will be particularly noticed under the heads to which they belong. See CATTLE, SHEEP, HORSE, SWINE, &c.

In many parts of the iſland, great advances have been made to a more perfect ſtate in the nature of different ſorts of live-ſtock, by ſelecting and employing the beſt and moſt perfectly formed animals, both male and female, but eſpecially the former, as ſtock to breed from; and in the midland, as well as ſome other counties, vaſt advantage has been gained in the ſame view, by the practice of the large and more opulent breeders and graziers letting their ſuperior male ſtock of different kinds of animals; and it would probably ſtill further promote this material object, if the more extenſive proprietors of lands were attentive to the circumſtance, by either providing ſuch male ſtock themſelves, or enabling their tenants effectually to do it, where their ſituations render it impoſſible. By ſome well concerted plan of this nature, a great and general change, ſo as to render the different ſorts of domeſtic animals much more perfect than they are at preſent, as well as better adapted to their ſituations, might be effected. But without ſome ſort of aid of this kind it does not ſeem probable, from the great expence attending the buſineſs, that any general improvement of them can take place, though it may be carried to a conſiderable extent in particular caſes and circumſtances.

LIVENSK, in *Geography*, a town of Ruſſia, in the government of Voronez; 36 miles W.S.W. of Voronez. N. lat. 51° 8'. E. long. 38° 14'.

LIVER, in *Anatomy* and *Phyſiology*, is the largeſt gland in the body, and performs the ſecretion of the bile. That fluid is conveyed from the liver by its excretory duct, called the hepatic; which ſometimes tranſmits it to the duodenum, and ſometimes, through a ſecond tube called the cyſtic duct, into the membranous bag connected to the liver, and named the gall-bladder. The anatomical deſcription of theſe organs, and the explanation of their functions are, the objects of this article.

The liver is a ſingle organ, like the others of the organic life, not ſymmetrical in its figure, yet tolerably conſtant in its peculiar ſhape; occupying the upper part of the cavity of the abdomen, where it is placed obliquely from right to left, the thickeſt portion filling up the right hypochondrium, or ſpace included by the falſe ribs of the right ſide, and the thinner part extending acroſs the middle of the body in the epigaſtric region to the left hypochondrium. It is more deeply covered by the ribs in the male than in the female ſex. In general it is ſmaller in proportion as the individual is more healthy: it generally becomes enlarged in ſize when diſeaſed.

It is ſituated immediately under the diaphragm, of which the tendon intervenes between it and the pericardium; and above the ſtomach, arch of the colon, duodenum, little omentum, gall-bladder, and right kidney. Behind, it lies againſt the vertebral column, the crura of the diaphragm, the œſophagus, the aorta and the inferior vena cava: and it is bounded in front by the cartilaginous edge of the cheſt. The right falſe ribs are on its right, and the ſpleen on its left.

The preſſure of the ſurrounding organs juſt enumerated, the connection which the inferior vena cava has to it, but more particularly certain folds of peritoneum, called its ligaments, retain it in its ſituation, leaving it however a conſiderable power of changing its relative poſition. Anatomiſts enumerate four or five ligaments, all of which connect the liver to the ſurface of the diaphragm; but they ſeem to be merely ſo many parts of one and the ſame production. From the middle of the diaphragm, beginning at the apex of the enſiform cartilage, and extending backwards with a little obliquity to the right, and from the aponeuroſis of the tranſverſus abdominis, almoſt as low as the navel, a fold of peritoneum, conſiſting of two laminæ, a right and left, paſſes to the convex ſurface of the liver, and is attached to it from the foſſa umbilicalis to the notch that receives the vena cava. This, which is called the ligamentum latum, or ſuſpenſorium hepatis, is narrow below and in front, grows broader in the middle, where it arrives at the diaphragm, and then becomes again very narrow behind: it poſſeſſes in fact a falciform ſhape, the convex margin being turned upwards, the concave downwards, and the apex backwards. The front and lower edge of the ligament is thick and rounded, and contains the remains of the umbilical vein of the fœtus, ſurrounded by more or leſs fat; this part, which is implanted in the front notch of the liver, is called the ligamentum teres hepatis. The two ſides of the ligament conſiſt of broad and ſmooth ſurfaces; of which one is turned forwards and in contact with the parietes of the abdomen below, and the diaphragm above; the other, turned backwards, lies againſt the liver above and the abdominal viſcera below. Beſides the umbilical vein, the two layers of this ligament include ſeveral lymphatic trunks proceeding from the liver to the cheſt. Its laminæ are continuous on one ſide with the peritoneum lining the abdominal cavity, and on the other with the external peritoneal covering of the liver. Its functions ſeem rather connected with the tranſmiſſion of the umbilical vein than with any confinement of the liver to a particular ſituation: for all the broad anterior portion is ſo looſe, that it does not at all limit the motions of the organ: where it is narrower, it may perform this office. It will confine the liver principally in its lateral motions. It is ſaid to have been ſometimes deficient; but the obſervation appears doubtful.

The two laminæ compoſing the broad ligament ſeparate from each other towards the poſterior part of the organ, and, as they proceed towards the right and left ſides, take the names of right and left or lateral ligaments of the liver. Theſe connect the reſpective lobes to the diaphragm; they have a triangular form; one ſide is looſe, one connected to the liver, and the third to the diaphragm. They conſiſt, like the broad ligament, of two layers of peritoneum, including a ſmall quantity of cellular ſubſtance, and ſome lymphatic veſſels. The left is commonly rather larger than the right.

The coronary ligament of the liver is a broad adheſion between the poſterior part of the organ and the ſurface of the diaphragm: the two parts are united by a cloſe cellular tiſſue through a ſurface of conſiderable extent. The boundaries of this union are formed by a very ſhort reflexion of peritoneum, by the broad ligament in front, and by the lateral ligaments at the ſides. The nature of the connection between the liver and diaphragm, will be beſt underſtood by obſerving the ſurface of the former after it has been removed from its ſituation. We then ſee the two laminæ of the broad ligament ſeparating from each other behind, and departing towards each ſide to form the lateral ligaments, which are alſo connected in a ſtraight line along the back edge of the liver. The broad ſpace, included between all theſe parts, and forming a ſurface of adheſion between the liver and diaphragm, is the coronary ligament. This connection acts very powerfully in maintaining the organ in its proper poſition, and preventing it from moving looſely in the abdomen.

We ſhould alſo enumerate, among the connections of the liver, a portion of peritoneum paſſing from it to the right kidney; and the little omentum which joins it to the ſtomach. (See EPIPLOON.) It muſt be remembered, that the connections juſt enumerated do not ſupport the weight of the liver in the living ſubject, as they appear to do after death, when the abdomen has been laid open. In that caſe the liver ſinks downwards from the diaphragm, becomes ſeparated from it by a conſiderable interval, and is ſupported in a great meaſure by the broad ligament. During life the ſurrounding organs maintain the liver in its place, and theſe are all ſupported and held in their reſpective ſituations by the action of the reſpiratory muſcles. Hence the organ is liable to changes of poſition according as theſe parts are moved, and it may be very variouſly affected in this way, as there are ſo many organs in contact with it. Whenever the diaphragm deſcends, the liver is carried downwards; and it moves in the contrary direction again when this muſcle paſſes towards the cheſt. In the latter ſtate, the thin edge of the liver is completely covered by the margin of the cheſt: hence, when we wiſh to preſs on the liver, we direct the patient to inſpire ſtrongly, that its edge may be thruſt below the ribs. Effuſion into the cheſt drives downwards both the diaphragm and liver: dropſy, pregnancy, or any other ſwellings in the abdomen, puſh them up towards the cheſt. When the ſtomach and inteſtines are empty, the liver deſcends: in the oppoſite ſtate of theſe parts it is puſhed upwards: hence the deſcent of the diaphragm is performed leſs eaſily after a full meal. In any erect poſture of the trunk, the liver deſcends about two finger's breadths, and is higher in about the ſame proportion in the recumbent poſture. When we lie on the right ſide, the liver is ſupported in the concavity of the correſponding falſe ribs, and preſſes on none of the ſurrounding organs; hence we commonly ſleep in that attitude. In lying on the other ſide, the weight of the liver comes upon the ſtomach, which produces unpleaſant feelings after a meal. Beſides theſe changes of poſition, which may happen generally in any ſubjects, there are others of a more peculiar and individual nature, ariſing from different ſize of the organ, greater or leſs concavity of the diaphragm, &c. However the poſition may be altered, the relations to ſurrounding parts are the ſame.

The volume of the organ varies according to age, regimen, and diſeaſe. The former varieties will be conſidered in ſpeaking of its developement. In general, it is the largeſt and heavieſt viſcus in the abdomen. It has been obſerved to be largeſt in thoſe who lead an inactive life, and who indulge in the pleaſures of the table: the ancient epicures uſed to produce an inordinate growth of the liver in geeſe by particular diet and management. But the moſt remarkable variations in the ſize of the liver are thoſe which occur in chronic diſeaſes: ſometimes it is diminiſhed and very manifeſtly indurated; much more frequently it is enlarged, ſometimes ſo much as to weigh ten or twelve or even more pounds. When it increaſes in this way, it uſually takes up a proportionally greater room in the abdomen. Boyer, however, ſaw it weighing eleven pounds, without having paſſed beyond the edge of the cheſt: it had driven the diaphragm upwards, almoſt to the firſt rib, and had reduced the right lung to a very ſmall volume. The ſubject was exceedingly fat. (Traité d'Anatomie, tom. iv. p. 393.) The ordinary weight of the liver in a healthy adult is about three pounds: Soemmerring ſays it may vary from two to five pounds. Its ſpecific gravity is to that of water as 15203 to 10000.

The colour is a browniſh-red, often inclining towards yellow. It is influenced very conſiderably by the quantity of blood in the veſſels, and conſequently is different in different modes of death. The organ is very pale in death from hemorrhage, and of a deep colour in caſes where its venous ſyſtem is much diſtended. Its deviations from the brown-red, which conſtitutes the proper liver colour, are generally into lighter and particularly yellow tints. The edges and inferior ſurface are often quite livid. The colour on the whole is clearer the younger the individual.

The figure of the liver is ſo irregular, that it is not eaſy to deſcribe it with clearneſs: we may ſtate generally that it is thick towards the right and back part, thin towards the left and front, flattened from above downwards, and elongated rather obliquely from the right and below, towards the left and upwards. We diſtinguiſh in it a ſuperior and inferior ſurface, an anterior and a poſterior edge, a right and a left extremity.

The ſuperior or convex ſurface, is convex, and adapted every where to the hollow of the diaphragm, to which it is contiguous throughout, except at the back part, in the ſituation of the coronary ligament, where it adheres firmly to the organ. The convexity is much greater behind and towards the right, than in front and on the left. Its particular direction is ſuch, that on the left it is turned upwards and rather forwards; in the middle upwards and rather more forwards; and on the right, backwards, upwards and outwards. It is divided into two parts, called lobes, by the broad ligament; the right diviſion, which is very much the largeſt, forms the right or great lobe; and the left the left or ſmall lobe.

The inferior or concave ſurface is a little inclined backwards, rather leſs extenſive than the preceding, and ſlightly and unequally concave. It exhibits eminences and depreſſions, ariſing apparently from the relations of the organ to the ſurrounding parts, and deep notches giving paſſage to blood-veſſels, which, as in all important viſcera, are formed in the moſt concealed ſituation about the organ. The following are the objects which this ſurface preſents in ſucceſſion from left to right. In their figure and arrangement they are ſubject to ſuch numerous varieties, that hardly any two livers agree together in this reſpect.

1. A broad ſuperficial depreſſion correſponding to the ſuperior ſurface of the ſtomach, and belonging to the left lobe.

2. The horizontal fiſſure or longitudinal groove (foſſa umbilicalis or longitudinalis, or ſiniſtra) divides all the inferior ſurface from before backwards, from the anterior edge to the left ſide of the paſſage of the inferior vena cava, and thus marks the ſeparation of the right and left lobes on their ſurface. The ſides are ſometimes partially united by a ſmall portion of liver, ſo as to form a canal. Its anterior part lodges the umbilical vein, and the poſterior narrower portion (foſſa ductum venoſi) contains the canalis venoſus, which, like that vein, is changed in the adult into a kind of ligament.

3. The great tranſverſe fiſſure (foſſa tranſverſa, or vena portarum,) is placed nearer to the poſterior than to the anterior edge, and runs from right to left in the direction of the great diameter of the inferior ſurface, of which it occupies about the middle third portion. It interſects the horizontal fiſſure at right angles. Its depth is conſiderable, particularly in the middle, and it is never covered by thoſe tranſverſe bridge-like portions, which have been mentioned in the former fiſſure. It is occupied by the trunk and firſt diviſion of the vena portarum, by the primary ramifications of the hepatic artery, and by the biliary tubes, which unite at their departure from the liver into a ſingle duct. The lymphatics and nerves of the liver are ſeen alſo in this ſituation. Theſe parts are all united by a tolerably cloſe cellular tiſſue.

4. Two eminences, ſometimes called portæ, of which one is placed before and the other behind the middle of the great tranſverſe fiſſure. The former (lobulus quadratus or anonymus) is broad and ſlightly elevated, reſembles a more or leſs regular parallelogram, and varies in ſize, according as the gall-bladder and tranſverſe fiſſure, which bound it, are more or leſs approximated. It extends even to the front edge, and ſeparates the anterior half of the horizontal fiſſure from the gall-bladder. The other eminence has been called the ſmall lobe of the liver, (lobulus Spigelii or papillatus.) It is ſometimes triangular and ſometimes quadrilateral in its figure. It is more prominent than the preceding, and placed at the poſterior edge of the liver, under the trunk of the vena portarum. It is ſingle in this ſituation, and reſts on the vertebræ,

tebræ, between the vena cava and œſophagus; thence it aſcends towards the front on the inferior ſurface of the liver, and is immediately divided into two other ſmall eminences. One of theſe is ſuperior and poſterior (lobulus caudatus), connects the ſmall lobe to the reſt of the liver, and paſſes obliquely towards the right, ſeparating the vena portarum from the vena cava. It then becomes broader, and forms a ſhort ſuperficial groove, continuous with the right extremity of the tranſverſe fiſſure, and on which the vena portarum reſts as it enters that fiſſure. The other eminence is more conſiderable, and forms a kind of obtuſe papilla directed forwards and downwards: this is the part properly called lobulus Spigelii. Separated from the reſt of the liver in front by the tranſverſe fiſſure, behind by the vena cava, on the left by the horizontal fiſſure, and the canalis venoſus contained in it, on the right by the vena portarum before its entrance into the tranſverſe fiſſure, this eminence appears to be connected to the organ only by the kind of root juſt deſcribed, and which paſſes under the right lobes, between the vena cava and vena portarum. But behind it is farther connected by a ſmall elongation, formed ſometimes by the ſubſtance of the liver, ſometimes by a fold of peritoneum, which ſerves to complete a very ſhort canal traverſed by the vena cava. This lobulus Spigelii is placed between the two orifices of the ſtomach: it correſponds below to the pancreas, above to the right and left lobes: in front of it is the little omentum.

5. In the right lobe, in the front of the right extremity of the tranſverſe fiſſure, and on the right of the lobulus quadratus, appears the excavation that lodges the gall-bladder. This is of an oval figore, ſuperficial, more or leſs diſtant from the longitudinal fiſſure, not covered by peritoneum, and lined only by the proper membrane of the liver, and by cellular tiſſue, which connects it ſtrongly to the gall-bladder.

6. Two ſtill more ſuperficial excavations are found quite to the right. The anterior correſponds to the hepatic flexure of the colon, and the poſterior to the right kidney and renal capſule.

The anterior or thin edge of the liver is thin, and inclined downwards. In the natural ſituation of the organ it correſponds nearly to the level of the baſis of the cheſt, being ſometimes a little above, but ſeldom below it. Its direction may be eaſily conceived from the general deſcription we have given of the organ. It is turned almoſt directly downwards on the right, and becomes more directly anterior towards the left. A notch is always ſeen in it towards the left, and forms the commencement of the horizontal fiſſure: to the right of this there is a broader ſuperficial excavation accommodated to the fundus of the gall-bladder.

The poſterior or thick margin is inclined upwards, not ſo long as the anterior, very thick on the right, and grows gradually thinner towards the left. Its middle is cloſely connected to the diaphragm by the coronary ligament; and the extremities are more looſely attached to the ſame organ by the lateral ligaments. Two excavations may be obſerved on this edge: a very deep and narrow one at the poſterior edge of the horizontal fiſſure, between the great lobe and the lobulus Spigelii, for the paſſage of the inferior vena cava; in this the orifices of the hepatic veins are ſeen. It is very ſlightly oblique from the left and below to the right and upwards, and covers about three-fourths of the circumference of the vein, ſometimes indeed the whole of it, forming a complete canal in the ſubſtance of the liver. The ſecond hollow, much broader and more ſuperficial, formed in the left lobe, correſponds to the vertebral column, the aorta, and œſophagus.

The right extremity of the liver is ſituated much lower than the left, and is the moſt bulky part of the organ. The left is very thin, extends more or leſs into the left hypochondrium, reaching above the ſpleen in ſome ſubjects.

Organiſation of the liver.—This is very complicated; beſides its peculiar tiſſue or parenchyma, the nature of which is perhaps more obſcure than that of other glands, it receives a larger number of veſſels. The greater part of the blood, brought from the placenta to the fœtus by the umbilical vein, circulates through this organ; in the adult we find only ſome impervious traces of this veſſel. A peculiar venous ſyſtem, that of the vena portarum, is at all ages entirely diſtributed in the liver. To theſe two orders of veſſels, which are not found in other ſituations, we muſt add the ramifications of the hepatic artery and veins, the nerves, which are ſmall for the organ, the lymphatic veſſels, the excretory tubes, and the peculiar tiſſue incloſed by a double membrane; all of which muſt be ſeparately conſidered.

Of the umbilical venous ſyſtem, which is ſo remarkable in the fœtus, nothing more can be diſcerned in the adult than the fibrous remains of the umbilical vein and canalis venoſus in the horizontal fiſſure of the liver.

The general arrangement and the organiſation of the vena portarum are deſcribed in the article HEART, under the head of *Abdominal ſyſtem of black blood.* We have to add here only a few details belonging to their deſcription.

1. A number of veins varying from three or four to ſeven or eight, of conſiderable ſize, come out of the ſpleen, and run tortuouſly in the fold of peritoneum, which fixes that organ to the ſtomach. After a ſhort courſe, in which they receive branches from the latter, they unite near the pancreas into a ſingle trunk, called the ſplenic vein.

2. The pancreas produces a conſiderable number of ſmall irregular branches, joining indifferently either of the principal trunks of the vena portarum, but more particularly the ſplenic vein.

3. Five orders of venous branches come from the ſtomach, and end either in the trunk or in the large branches, which make up the vena portarum. 1. Several go from the great extremity to the conſtituent branches, or to the trunk of the ſplenic vein. 2. The pyloric vein, belonging to the ſmall curvature, opens into the trunk of the vena portarum. 3. The ſuperior gaſtric or coronary ſtomachic vein, following the artery of the ſame name, joins the ſplenic trunk. 4, 5. The right and left inferior gaſtric veins run along the great curvature, and join reſpectively the trunk of the vena portarum, and the ſplenic vein.

4. The duodenal veins join either the right inferior gaſtric, the ſuperior meſenteric, or vena portarum.

5. The veins of the ſmall inteſtine anaſtomoſe, like the arteries, and form a moſt extenſive net-work between the two laminæ of the meſentery. The communications become fewer and the trunks larger, in proportion as they are more diſtant from the inteſtine: they form at laſt 15 or 20 veins, which join ſucceſſively the large trunk of the ſuperior meſenteric vein accompanying the artery of the ſame name.

6. The veins of the cæcum, right portion of the colon, and right ſide of the arch, follow the courſe of the arteries, and end, under the names of ileo-cæcal, right colic, and middle colic, in the trunk of the ſuperior meſenteric.

7. The veins, which return the blood from the left ſide of the arch of the colon, from the deſcending colon, the ſigmoid flexure and rectum, form as many principal branches as there are chief diviſions of the inferior meſenteric artery: a large trunk, accompanying that artery, is formed by their

union, and is called the inferior meſenteric vein. From the rectum, of which the veins are often called the hæmorrhoidal, the inferior meſenteric trunk aſcends parallel to the inteſtine, goes behind the tranſverſe meſocolon, and terminates behind the pancreas, at a right angle, in the ſplenic vein. This vein is very ſmall at its origin, where it anaſtomoſes with thoſe of the hypogaſtric plexus: it grows larger as it aſcends, and is nearly equal in diameter to the ſuperior meſenteric vein at its termination.

Thus we obſerve, that there are two principal trunks forming the vena portarum, and receiving nearly all the veins of the organs, from which this peculiar venous ſyſtem derives its origin; theſe are the ſuperior meſenteric and the ſplenic; ſome branches, however, directly join the trunk. The ſplenic, formed in the manner already ſpecified, is not tortuous like the artery, runs in company with, but below it, along the upper edge of the pancreas, in an horizontal direction from left to right. In front of the vertebral column it ends, at nearly a right angle, in the vena portarum. In this courſe it receives veins from the great end of the ſtomach, the left inferior gaſtric vein, the inferior meſenteric, the ſuperior gaſtric, and ſeveral pancreatic veins. The ſuperior meſenteric vein, in the greateſt part of its courſe, accompanies the artery of the ſame name, being placed to the right, and a little in front of it. It ariſes where the artery ends, that is, near the cæcum and the right ſide of the colon; it aſcends, following the ſame courſe with the artery, between the two layers of the meſentery, and becomes larger as it receives new branches. At the poſterior edge of the meſocolon it goes behind the pancreas, and joins at a ſomewhat obtuſe angle the ſplenic vein, to form the trunk of the vena portarum, or the ventral or abdominal vena p., as it is ſometimes called, to diſtinguiſh it from that end which ramifies in the liver, and which is called the hepatic vena p. In this ſituation it is more than an inch diſtant from the end of the inferior meſenteric vein. It receives, on the concave ſide of its curve, the three veins from the right portion of the large inteſtine; on the convex or left ſide the numerous veins of the ſmall inteſtine. Several duodenal and pancreatic veins join it where it paſſes between the duodenum and pancreas.

The trunk of the vena portarum, the diameter of which is much leſs than the united diameters of the two preceding veins, goes obliquely upwards to the right, and a little backwards, and paſſes through a ſpace of about four or five inches in the adult, from the vertebral column to the great tranſverſe fiſſure of the liver. At firſt it is ſituated behind the right extremity of the pancreas, and the ſecond portion of the duodenum; it then forms a part of the faſciculus of biliary veſſels contained in the capſula Gliſſoni (ſee EPIPLOÖN), where the biliary ducts and the hepatic artery cover it in front. Like the laſt mentioned parts, it is ſurrounded by numerous nerves, lymphatic veſſels and glands; and theſe organs are all connected by a tolerably denſe and copious cellular tiſſue. When the trunk has arrived at the notch of the liver, it is bifurcated, and each branch forms with it nearly a right angle; ſo that the two taken together repreſent a horizontal canal lying in the notch of the liver, connected cloſely on each ſide to the correſponding diviſions of the hepatic artery, and having the trunk of the vena portarum opening perpendicularly into its middle. This canal, ſometimes called by anatomiſts the ſinus of the vena portarum, does not immediately touch the ſubſtance of the liver; a thick layer of denſe cellular tiſſue ſeparates it, and is continuous with the general external covering of the diviſions of the vein in the organ. The right branch, ſhorter, but much larger than the left, enters the great lobe by the correſponding extremity of the tranſverſe notch, and divides into an uncertain number of branches. The other paſſes horizontally towards the left, as far as the notch containing the umbilical vein, of which the remaining fibrous cord is firmly attached to it, and ſplits into branches diſtributed through the left lobe. The primary and ſecondary diviſions generally purſue a horizontal courſe; they then divide into an infinite number of ramifications, the diſtribution of which we cannot regularly follow, and which end at laſt in a capillary ſyſtem extending throughout the ſubſtance of the organ. Each of the ramifications, which we can eaſily trace in the liver, is accompanied by a branch of the hepatic artery, by one or more biliary ducts, ſome nervous filaments, and lymphatic veſſels. Theſe parts are connected and ſurrounded by a fine layer of cellular tiſſue, which adheres cloſely to the ſubſtance of the liver, and is often deſcribed by the name of capſule of Gliſſon; it ſeems to inſulate the parts which it ſurrounds, as it ſeparates them from the proper tiſſue of the liver. It has no connection with the peritoneum, and the ſuppoſitions of its muſcularity and its propelling the blood by that power are ſupported by no proofs whatever. Boyer regards it as a prolongation of the proper membrane of the liver, which, he ſays, is reflected over all the veſſels that enter or quit the organ. As the parts contained in theſe capſules are connected to each other by looſe cellular tiſſue, which enters the liver with them, the orifices of the vena portarum, on a ſection of the organ, have a looſe plaited appearance, diſtinguiſhing them from thoſe of the hepatic veins, which, as they are intimately connected to the proper tiſſue of the liver, preſerve their circular area, and preſent a much cleaner cut.

The hepatic artery is a branch of the cæliac trunk, and has been deſcribed in the article ARTERY. Its branches enter at the great notch, and every where accompany the ramifications of the vena portarum.

The deſcription of the hepatic veins is given in the article VEIN. We have to notice here only the circumſtances that deſerve attention, concerning their diſtribution in the liver. They return, to the general venous ſyſtem, the blood which is brought into the liver both by the hepatic artery and the vena portarum. They ariſe, therefore, out of the capillary ſyſtem, in which the two orders of veſſels, juſt named, terminate. They unite ſucceſſively into larger and larger branches, which form ultimately three principal and ſome ſmaller trunks, opening into the inferior vena cava, juſt under the diaphragm. This proximity to the heart accounts for their being ſo often diſtended with blood in the dead body. Beſides the direction, in which the blood paſſes through them, the hepatic veins are diſtinguiſhed by two principal circumſtances. Their ſides are rather thinner than thoſe of the vena portarum; and they have no trace of the cellular covering, deſcribed above, as belonging to the ramifications of the latter veſſel, but adhere immediately to the tiſſue of the liver, ſo as to preſent a perfectly circular area on a ſection.

The nerves, which are ſmall in compariſon to the bulk of the organ, come chiefly from the plexus of cæliac ganglia; but ſeveral filaments from the eighth pair join theſe. See NERVE.

The lymphatic veſſels of the liver are very numerous, inſomuch that no other organ ſeems to be more abundantly ſupplied with them. They are diſtinguiſhed into two orders, the ſuperficial and the deep-ſeated. The former cover the whole external ſurface, and are eaſily diſtinguiſhed by the contraſt of their colour with that of the tiſſue of the liver. The latter, ariſing in the ſubſtance of the organ, follow the ramifications of the vena portarum and the hepatic artery. They communicate frequently together, and end by numerous trunks in the thoracic duct, after paſſing through different glands.

The biliary ducts ariſe in all parts of the liver by capillary extremities, which are too minute for our moſt delicate means of reſearch. They unite together, in the manner of veins, into larger and larger trunks, which at laſt end in producing two or three principal ones, quitting the liver at the tranſverſe notch, and then united into a ſingle tube, of about a line and a half in diameter, called the hepatic duct.

All the branches of the hepatic duct in the liver, accompany the diviſions of the vena portarum, and are incloſed with them in the cellular covering already deſcribed. They are eaſily diſtinguiſhed, on a ſection, by the yellow tint which they acquire from the tranſudation of the bile, and the orifices are then called pori biliarii. Indeed, we may eaſily diſtinguiſh, on a cut piece of liver, all the veſſels belonging to it. The yellow colour and greater thickneſs mark the biliary tubes; the coats of the arteries are not quite ſo thick, and not coloured; the branches of the vena portarum are next in order of thickneſs, and are remarkable for their cellular covering; the hepatic veins are the thinneſt.

Whether the capillary beginnings of the biliary ducts come from the acini of the liver, and concur with the capillary blood-veſſels in forming thoſe acini, is a point which we really cannot determine.

Of the peculiar tiſſue or parenchyma of the liver.—The ſubſtance of the organ is next, in point of denſity, to that of the kidney; yet it yields with tolerable facility to the preſſure of the finger.

When we cut into its ſubſtance, we obſerve the colour diſtinguiſhed from that of the exterior by a ſlight yellowiſh tint. It is porous from the great number of veſſels diſtributed through it, and ſeveral yellow points are diſtinguiſhed, which are the ſmall biliary tubes. The different orders of veſſels may be recognized by the characters already explained; the veins contain more or leſs blood, which may be eaſily ſqueezed out. The cut ſurface is ſmooth, and made up of ſmall points alternately of a reddiſh-brown and an obſcure yellow. The ſubſtance of the organ may be eaſily torn; the ſurface is then unequal and granular, compoſed indeed entirely of ſmall granular bodies with every variety of figure, about the ſize of millet ſeeds, of an obſcure red colour, and ſoft conſiſtence. Theſe are the acini of anatomiſts, and are united together, as well as all the veſſels that ramify in the organ, by a fine cellular tiſſue. Long controverſies have exiſted concerning their nature; but we have nothing to add on this ſubject to what we have ſtated in the article Gland.

In fact, we are entirely ignorant of the nature of theſe ſmall bodies, which compoſe the proper tiſſue of the liver, and we know no more concerning its minute organiſation than about that of other parts. We ſee blood-veſſels both of the arterial and venous kind, a peculiar order of veins not found in other organs, lymphatics, excretory tubes, nerves, ſmall ſoft and reddiſh granular bodies, cellular tiſſue to connect all theſe together, and common coverings to inſulate the organ; ſuch is the account of our knowledge concerning the organiſation of this part. Chemiſtry does not diſcloſe to us any thing more ſatisfactory; we know that it is the ſloweſt of all parenchymatous organs in putrefaction, after the kidney; that it loſes much of its weight, and acquires ſomething of a fatty nature by drying; that it is ſoftened by ebullition; diſſolved in ſulphuric acid, which it tinges of a deep violet colour; and rendered coriaceous and greyiſh in nitrous acid. But theſe facts do not much illuſtrate its organiſation. We find, laſtly, that diſeaſe produces in its ſtructure changes as numerous as they are difficult of explanation.

The liver is covered by two membranes, a ſerous and a cellular one, which are very differently arranged.

The external is formed of peritoneum, and covers the whole ſurface, except the poſterior edge, in the ſituation of the coronary ligament, the excavation for the inferior vena cava, that for the gall-bladder, and the two fiſſures of the inferior ſurface. It reſembles the peritoneum in general; is ſmooth and poliſhed on the external ſurface, and connected very cloſely by the internal to the proper membrane of the liver, except in the ſituations already ſpecified.

The other membrane, called by Soemmerring membrana celluloſa hepatis, has been moſt minutely deſcribed by the French anatomiſts, who aſſign the diſcovery of it to M. Laennec. Boyer deſcribes it as covering the external ſurface of the organ, and moreover reflected over the veſſels that enter it. Its internal ſurface correſponds to the tiſſue of the liver, to which it adheres very cloſely. It ſends ſheaths over the veſſels; the moſt conſpicuous of theſe is the capſula Gliſſoni, already deſcribed; but the hepatic veſſels have one cloſely connected to them and to the ſurrounding ſubſtance of the liver, and the umbilical vein in the fœtus is furniſhed with a ſimilar covering. This proper membrane of the liver is thin, tranſparent, and of a ſlightly yellow tint. It is ſtronger than the peritoneum; hardly admits of extenſion, and exhibits nothing fibrous in its texture. It may be beſt ſhewn in the ſituations where it is not covered by peritoneum: by making an inciſion, and introducing the handle of a ſcalpel, it may be eaſily ſeparated from the ſubſtance of the organ.

If the hepatic artery be injected, in a healthy liver, with any fluid kind of injection, as ſize coloured with vermilion, no point can be diſcerned in the whole organ, more particularly if the microſcope be employed, in which branches of this veſſel are not viſible. The ſame obſervation may be made concerning the vena portarum, the hepatic veins, and the hepatic duct. If the injection be puſhed farther, it will paſs out of one of theſe veſſels into the others; that is, it will paſs from the hepatic artery into the vein of the ſame name, into the vena portarum, and into the biliary duct; or, *vice verſâ*, from either of theſe into the artery, &c. Injections do not paſs from the artery into the abſorbents, unleſs when there has been an effuſion into the ſubſtance of the organ. It is ſaid that the abſorbents have been filled with liquors thrown into the vena portarum; and that the ſame circumſtance readily takes place where mercury is introduced into the hepatic duct.

Theſe facts concur with the reſult of the moſt careful inſpection, aided even by the microſcope, in proving that there is an uninterrupted paſſage from one order of veſſels into the other, and nothing of a cellular or veſicular nature interpoſed between them.

Of the apparatus connected with the excretion of the bile.—The tube, which we have already deſcribed, as being formed by the union of all the excretory canals in the liver, under the name of the hepatic duct, paſſes from the great notch of the liver towards the left, being at the ſame time inclined ſlightly downwards and forwards, and is continued to the duodenum, in which it opens. It runs between the two laminæ of the little omentum, ſurrounded by fat and cellular tiſſue, which is generally dyed of a yellow colour by the tranſudation of the bile. It lies on the anterior edge of this omentum, in front and rather to the right of the vena portarum, with which it is extenſively in contact, and to the right of the hepatic artery. Its ſize is about that of a large writing quill, its figure cylindrical, and its length from four to ſix inches. At about an inch or an inch and a half from the liver, we obſerve in it the ſimple round opening of the cyſtic duct. From this part to its termination it generally goes by the name of ductus communis choledochus; but the diſtinction is quite an artificial one. When it arrives near the duodenum, it becomes covered by the pancreas, which adheres cloſely to it, and advances along the poſterior and inferior portion of the ſecond flexure of the duodenum. It penetrates the muſcular coat and that inteſtine, and receives the termination of the pancreatic duct. Having paſſed obliquely between the muſcular and mucous coats, for the ſpace of an inch nearly, it penetrates the latter, and opens into the inteſtine by a ſmall orifice on one of its folds. The mucous coat of the latter, and the internal ſurface of the duct, are here continuous. When we examine the opening of the canal, we ſee a ſmall eminence, nearly of the ſize of a pea, rounded, rather oblong, and divided in the middle; there is no valve, nor any muſcular fibres arranged like a ſphincter. The oblique courſe of the canal between the inteſtinal coats prevents the paſſage of the contents of the inteſtine into the duct, even when the inteſtine is the moſt fully diſtended. The duct is compreſſed whenever the gut is filled, and more powerfully in proportion as the diſtention is greater. If the duodenum be inflated, and the duct cut through, no air eſcapes. Ordinarily, too, we cannot doubt that the particular ſenſibility of the canal enables it to reject matters that are extraneous to it.

Sometimes this duct does not receive the pancreatic. Obſervations are recorded, in which it is ſaid to have opened into the ſtomach, and cloſe to the pylorus; but their correctneſs is doubtful.

The cyſtic duct, of which we have mentioned the opening into the hepatic, is a ſhort canal, leading from the latter tube into the gall-bladder, and conveying into that receptacle a portion of the bile, before it goes to the duodenum.

The gall-bladder.—This bag does not exiſt in ſeveral genera of the mammalia; it has ſometimes, but very rarely, been deficient in the human ſubject, without cauſing any ſenſible derangement of functions. Sometimes alſo there have been two gall-bladders.

It is placed obliquely, under the front of the great lobe of the liver, in the excavation already deſcribed, above the colon and duodenum, to the right of the horizontal fiſſure and the lobulus quadratus, and in front of the right end of the tranſverſe notch. Its moſt uſual figure is pyriform; ſometimes it is rather oval, or cylindrical. We remark in it an external and an internal ſurface, an anterior extremity called the fundus, a poſterior named the neck, and a middle portion or body. The fundus, or large extremity of the gall-bladder, is directed forwards, a little to the right and downwards, and the ſmall end backwards, to the left and upwards. But the direction varies conſiderably according to the attitude of the body. In the ſupine poſture the fundus is higher than the neck; the contrary is the caſe in lying on the right ſide.

The external ſurface of the gall-bladder correſponds above to the excavation in the right lobe of the liver; this part has been called the hepatic ſurface. Here it is not covered by peritoneum, but adheres immediately to the proper membrane of the liver, by means of a copious cellular ſubſtance, containing numerous blood-veſſels. Sometimes it has been connected to the liver by a ſmall kind of meſentery, and covered univerſally by peritoneum. The inferior part is ſmooth, covered by peritoneum, and contiguous to the colon and firſt portion of the duodenum; it is called the looſe or abdominal ſurface.

The anterior extremity, or fundus, turned forwards, downwards and to the right is rounded, ſmooth, and covered partially or entirely by peritoneum. It correſponds to an excavation in the anterior edge of the liver, and protrudes more or leſs beyond this according to the quantity of bile it contains. When it is empty, its fundus does not extend beyond this edge; but, in the diſtended ſtate, it projects from the liver, and is applied againſt the abdominal parietes, below the middle of the cartilage of the ſecond falſe rib.

The neck, or poſterior extremity, which is directed rather upwards and to the left, is bent upon itſelf, the convexity of the curve looking upwards, and the concavity downwards. It is terminated by the cyſtic duct, which, after a courſe of about an inch and a half, unites with the hepatic duct at a very acute angle. The internal ſurface of the gall-bladder preſents a deep yellow or greeniſh tint, according to the colour of the bile; indeed, all this excretory apparatus is tinged after death in the ſame manner, but not ſo deeply as the ſurface of the gall-bladder. This effect takes place very quickly after death: when the coats of the parts, that immediately contain the bile, are coloured, the continuance of the tranſudation affects all the neighbouring organs to a greater or leſs degree. This internal ſurface of the gall-bladder is extremely irregular; it is univerſally covered with riſing lines, decuſſating each other, and intercepting ſmall areolæ of various figures. Theſe are again covered by other more minute lines, which divide the ſurface into very ſmall ſpaces. Similar riſing lines, but more elevated, are found towards the neck of the gall-bladder, and throughout the cyſtic duct. The whole ſurface of theſe parts, in conſequence of this ſtructure, exhibits a very beautiful rugous and cellular appearance. Beſides theſe rugæ of the internal coat, the neck of the gall-bladder exhibits four or five tranſverſe ſemilunar folds, projecting into the cavity, and formed by duplicatures of the mucous coat.

The capacity of the gall-bladder may be eſtimated at about one ounce.

The cyſtic duct is a contracted continuation of the neck of the gall-bladder, about equal to a large crow-quill in diameter. It forms at its commencement a remarkable turn, of which the convexity is towards the liver and the concavity downward. From the gall-bladder it firſt aſcends, then makes this turn, and afterwards paſſes downwards, between the laminæ of the little omentum, parallel and cloſe to the hepatic duct. After a courſe of about an inch and a half it opens into that duct at a very acute angle. The cyſtic duct has an irregular knotted appearance on its external ſurface, which ariſes from numerous ſemilunar folds, analogous to thoſe at the neck of the gall-bladder, projecting into its cavity, and very much narrowing its dimenſions.

Two coats, a ſerous and a mucous, compoſe the gall-bladder. The former, derived from the peritoneum, gives only a partial covering to the organ. This membrane is raiſed from the liver, at the circumference of the depreſſion lodging the gall-bladder, and covers this viſcus every where, except at its adheſion to the ſurface of the liver. It is continuous below with the ſuperior layer of the little omentum. The peritoneal coat is connected to the mucous by a tolerably thick and uniform layer of cellular tiſſue, the cellular coat of ſome writers. Some firm and rather ſhining threads, moſtly of a longitudinal direction, are obſerved in this tiſſue, and have been often conſidered of a muſcular nature. The blood-veſſels and abſorbents form a net-work in this cellular ſubſtance, which ſometimes contains a little fat. The internal, mucous, or villous coat, as it is frequently called, is connected below and at the ſides to the peritoneal covering; above to the proper membrane of the liver. The inner ſurface preſents the rugæ already noticed. It is of conſiderable thickneſs, and has a kind of ſpongy texture. During life it is white; the tint of the bile never being communicated until after death. Several anatomiſts have deſcribed mucous glands and follicles in this membrane; but they cannot be ſatisfactorily aſcertained. Soemmerring, however, deſcribes glands near the neck as large as millet ſeeds. On account of the folds and rugæ of the internal ſurface, its extent is much increaſed when the cellular ſubſtance is removed from the outſide. After a ſucceſsful injection of the blood-veſſels, this coat appears to conſiſt entirely of a vaſcular net-work.

The artery of the gall-bladder is a branch of the hepatic; the veins join the vena portarum. The lymphatics, which are numerous and large, join thoſe of the inferior ſurface of the liver. The nerves come from the hepatic plexus.

Anatomiſts formerly admitted the exiſtence of veſſels paſſing directly from the liver into the gall-bladder, under the name of hepatico-cyſtic ducts. Such veſſels exiſt in birds, but they certainly do not belong to the human ſubject; the only connection between the liver and gall-bladder being through the medium of the hepatic and cyſtic ducts.

The organiſation of the hepatic and cyſtic ducts is eſſentially the ſame. They have two coats, an external fibrous one, and a mucous or internal lining. The former is thick, denſe, and ſtrong, and compoſed apparently of whitiſh longitudinal fibres, which have nothing muſcular in their appearance, and the nature of which is not well underſtood. The mucous coat is thin and ſoft, and preſents in ſome parts the ſame areolated texture as on the internal ſurface of the gall-bladder: the whole of the cyſtic duct has this peculiar arrangement, and its internal membrane forms the tranſverſe folds already mentioned. The hepatic duct, from the liver to near the point at which it enters the inteſtine, is ſmooth: it has ſome longitudinal folds about its middle, and is reticulated near the duodenum.

Theſe ducts poſſeſs very great extenſibility: they are ſometimes dilated, by the paſſage of calculi, to the ſize of a thumb. They, as well as the gall-bladder, act on their contents by the inſenſible organic contractility, or tonic power. They are never ſeen to contract ſenſibly in any obſervations of living animals, nor do the ſtimuli, which excite contractions in the muſcles, produce the ſame effect on them. Probably the paſſage of the food over the orifice of the duct in the duodenum is the exciting cauſe of their actions. Although they are not ſenſible in the natural ſtate, diſeaſe developes this property in them to a remarkable degree. No pain is more acute than that produced by calculi in theſe ducts.

Developement of the liver.—This organ is diſcerned in the embryo before any of the other viſcera; and it is proportionally larger in the early months of conception, than at any future time. Wriſberg ſaw it in a fœtus of ten weeks ſo large, that it occupied nearly the whole abdomen. Walter ſays that it can be ſeen at twenty-two days. At theſe periods it appears to be not much leſs than half the weight of the body. This great bulk of the organ does not laſt through the whole of geſtation; after the fourth month, it does not proceed ſo rapidly in its growth, although it maintains a remarkable predominance over the other viſcera till the time of birth. As a general obſervation we may aſſert, that it is larger in proportion as the animal is nearer to the time of its firſt formation.

During fetal exiſtence, the blood of the umbilical vein circulates through the liver, on its way to the heart: but the whole of this blood is ſent to the left lobe. (See the deſcription of the umbilical veſſels in the article EMBRYO, and the article CIRCULATION.) Hence that lobe is quite as large, if not larger, than the right. From this great bulk of the organ, as well as from the breadth of the baſis of the cheſt, and the ſmall concavity of the diaphragm, the relations of the liver to the ſurrounding parts are very different from what we obſerve in the adult. It not only fills both hypochondria and the epigaſtric region, but deſcends below the ribs, as far as the umbilicus, and fills half the abdomen. It is placed at this time more perpendicularly in the body, ſo that the convex and concave ſurfaces, which are ſuperior and inferior in the adult, are nearly anterior and poſterior in the fœtus. The anterior ſurface is extenſively in contact with the abdominal parietes: the poſterior covers the ſtomach, ſpleen, and even omentum. Its tiſſue at this time is ſoft and ſpongy, and contains a large quantity of blood: the latter circumſtance gives to the organ a darker colour than it has in the adult.

We are entirely ignorant of the functions performed by the liver during fetal exiſtence, of the relation between its ſize and any of the proceſſes of the animal economy, and whether any changes are produced in the blood as it paſſes through the organ.

The excretory part of the hepatic ſyſtem is not proportioned in its developement to the ſize of the liver in the fœtus: for the latter circumſtance is connected with the circulation, and not with the biliary ſecretion. The internal ſurface of the gall-bladder is at firſt ſmooth, and does not exhibit the areolated ſtructure until the latter months of geſtation. According to different authors this bag contains no bile, but merely a reddiſh mucus, until the 4th, 5th, or 6th month: its fundus is completely concealed behind the edge of the liver. At the time of birth it is always full of bile; but the fluid is ſtill reddiſh and mucous, and poſſeſſes but little taſte.

The ſudden revolution that occurs in the circulating ſyſtem at birth, produces a remarkable change in the liver. The interception of the blood, which was conveyed to the organ by the umbilical vein, is followed by a very marked reduction in its ſize affecting particularly the left lobe. The tiſſue of the organ is rendered more denſe, and its colour acquires a brighter red tint, or becomes pale. After a certain time the organ participates in the progreſs of the other parts of the body. The excretory apparatus undergoes no remarkable change: it is not ſo readily tinged with bile, as at a more advanced age, probably from ſome change in the nature and properties of that fluid. In the old ſubject the organ ſometimes is reduced in ſize, and frequently becomes more ſoft. On the whole, however, after the changes conſequent on birth have been completely effected, and the liver has acquired its permanent relation to the other organs, very little change takes place in it.

The ſecretion and courſe of the bile.—That this fluid is ſeparated in the liver, and conveyed from that organ by the hepatic duct, are points ſo clear, that they do not require any expreſs proof. From which order of veſſels in the liver this ſecretion takes place, is a queſtion not ſo eaſily anſwered. Phyſiologiſts have generally aſcribed this office to the vena portarum, and have conſidered the hepatic artery to be the nutrient veſſel of the organ, as the bronchial arteries are of the lungs. They give the following reaſons for this opinion. 1. The excretory duct is larger than the artery, a circumſtance which does not occur in any other gland: its ſize however

ever is ſuitable to that of the vena portarum. 2. The agreement of the properties of the bile, particularly its thick oily nature, acrid taſte, and dark colour, with the ſuppoſed peculiar nature of the blood returned by the vena portarum. This blood, it is ſaid, is brought from very warm and moiſt parts, loaded with fatty matter from the omenta meſentery, &c. and with alkaline and acrimonious particles from the inteſtines, particularly the large ones. Its ſuppoſed ſtagnation in the cells of the ſpleen has been conceived to impart to it ſome further peculiar properties, favourable to the formation of the bile. 3. Experiments on living animals, in which the ſecretion has been ſtopped by tying the vena portarum, and not interrupted by tying the hepatic artery. 4. The peculiar diſtribution of the vein, after the manner of an artery, in the liver, combined with the particular qualities of the blood circulating in it. 5. The artery is larger in ſize in the fœtus, in proportion to the greater bulk of the organ, although the ſecretion of bile is very ſmall in quantity at a time when digeſtion has not begun.

As a proof that bile may be ſecreted from arterial blood a fact may be adduced, that occurred to Mr. Abernethy, and is recorded in the Philoſophical Tranſactions. In a well-formed and nouriſhed child, whoſe gall-bladder contained bile, the vena portarum terminated in the inferior vena cava near the renal veins.

There are ſeveral other conſiderations tending to weaken our confidence in the received opinion. Much reliance cannot be placed on the relative diameters of the artery and duct: if the latter be too large for the former, it muſt be regarded as too ſmall in proportion to the vena portarum. According to Bichat there is the ſame relation between them as between the renal artery and ureter.

We know of no comparative analyſis of the blood, contained in the vena portarum and the hepatic artery, that warrants us in aſcribing to the former qualities particularly ſuited to the ſecretion of bile. Certainly we do not ſee in it thoſe properties which are ſaid to characteriſe it: we do not diſcover oily particles in it, and we believe the ſuppoſition of its imbibing any thing from the excrement to be perfectly gratuitous. Indeed Haller expreſsly acknowledges that the properties, which the blood of the vena portarum *muſt* neceſſarily acquire in its circulation, cannot be diſcovered by chemical analyſis. Why is venous blood ſo particularly ſuited to the ſecretion of an oily fluid? are not fat, the medulla of bones, and cerumen formed from materials conveyed in the arteries? That any thing acquired by the blood in the ſpleen cannot be eſſential, is proved by the fact, that extirpation of that organ does not injure the hepatic functions. We do not underſtand clearly how the retarded motion of the blood in this vein (if in reality it be retarded) aſſiſts the formation of bile? How happens it that ſlowneſs of motion is more favourable to this than to any other ſecretion? We cannot reaſonably apply inferences drawn from what takes place in an animal after ſuch a ſerious injury as the ligature of the vena portarum or hepatic artery, to the natural functions of the organ. How long did the animals live after theſe experiments? and in what way were the facts of the ſecretion or non-ſecretion of the bile aſcertained? "Theſe different reflections," ſays Bichat, "may convince us, that our proofs are not as yet ſufficient to decide whether the bile is ſecreted from arterial or from the abdominal ſyſtem of venous blood. I do not attribute the function to one rather than to the other: but merely endeavour to ſhew that a freſh examination of the queſtion is neceſſary, and to prove by this example that the moſt generally received phyſiological opinions, ſuch as ſeem to be placed beyond all doubt by the concurring aſſent of the moſt celebrated men, often reſt on very uncertain foundations. We are yet far from the time when this ſcience ſhall conſiſt only of a ſeries of facts rigorouſly deduced one from the other." Anatomie Generale, tom. i. p. 457.

The great ſize of the liver, the number and magnitude of the parts which compoſe its complicated vaſcular machinery, its enormous magnitude in the early ſtages of fetal exiſtence, and its eſpecial connection with the circulating organs at that period, all lead us to conclude that it anſwers ſome other purpoſe in the economy beſides the ſecretion of the bile. This probability, and the reaſons on which it is grounded, are ſo well ſtated by Bichat, in his Anatomie Generale, that we ſhall avail ourſelves of his labours on this point.

"From ſerving as the point of termination for the abdominal ſyſtem of black blood, as the lungs do for the general ſyſtem of the ſame deſcription, the liver derives a degree of importance, which does not belong to any other ſecretory organ. The diſproportion between the ſize of the organ and the quantity of fluid it ſecretes, has led ſome authors to ſuſpect that the organ muſt have a further office: and this ſuſpicion ſeems to be almoſt a certainty. Compare its excretory tubes and reſervoir to the analogous parts in the kidnies, the ſalivary glands, the pancreas: you will find them inferior to the firſt, and hardly ſuperior in ſize to the others. Yet the maſs of the liver at leaſt equals all the other glands in the body put together. This great ſize of the organ contraſts remarkably with the ſmall quantity of its ſecretion: calculate how much is conſumed in colouring the feces, open the inteſtines to ſee how much they contain at different times, and you will be convinced that the quantity of the bile is much leſs than that of the urine, not to mention the other ſecreted fluids, ſuch as the ſaliva, pancreatic liquor, ſemen, mucous fluids, &c.

"We are altogether ignorant what the other uſe of the bile may be. Probably it is connected with the abdominal ſyſtem of black blood. The following conſiderations prove that it muſt be a very important one. The organ exiſts in almoſt all claſſes of animals, even where ſome other important viſcera are very imperfect. Many of the paſſions affect it: ſome of them have an excluſive effect on it. It performs in diſeaſe as prominent a part as any of the important viſcera of the economy. In hypochondria, melancholia, &c. its influence is very conſiderable. We know how eaſily its functions are diſturbed. If it be unconnected with many affections called bilious, and which have their ſeat in the ſtomach, it is certainly eſſentially concerned in the greater part. The yellowiſh tint of the face in many of theſe affections muſt be produced by the ſame cauſe, which, in a higher degree, produces jaundice. The affections of this organ, obſerved after death, are more numerous than thoſe of any ſimilar part. It is a matter of common obſervation, that this organ has a great influence on the temperament. Its predominance communicates to the external habit of the body, to the functions, to the paſſions, even to the character, a peculiar tint, which was obſerved by the ancients, and the reality of which has been confirmed by modern obſervation. Nothing like this can be obſerved of the other glands. With the heart and brain this is the part firſt formed: its developement precedes that of all other organs, and is incomparably ſuperior to that of other glands. It has been latterly ſuppoſed that the liver aſſiſts the lungs in removing from the blood hydrogen and carbon. I know not on what proofs this aſſertion may reſt: but the colour of the fluid is certainly not affected by its paſſage through the liver: neither is it altered in conſiſtence, nor in any way that can be recognized by the touch."

Courſe of the bile.—There are two kinds of this fluid, differing conſiderably in their properties, and diſtinguiſhed by the names of hepatic and cyſtic. The former, which is contained in the hepatic duct, and in the branches of that tube diſtributed through the liver, approaches in fluidity to water, is of a bright orange colour, and not bitter: ſo far, indeed, is it from containing any qualities offenſive to the taſte, that the livers of animals, which muſt always contain much of it, are commonly employed for food. The latter, or bile of the gall-bladder, is a thick ropy fluid, of a deep orange, brown, or even green tint, and moſt intenſely bitter. Both theſe kinds are ſecreted in the liver, and originally are not different. The gall-bladder receives what it contains through the cyſtic duct, and produces in it the changes juſt deſcribed while it remains in this reſervoir. A copious mucous ſecretion takes place from its lining, and the aqueous parts of the bile are removed by the numerous and large abſorbents of the receptacle. The cyſtic bile is, therefore, nothing more than hepatic bile in a concentrated ſtate. It is eaſy to prove that the gall-bladder can receive bile only through the cyſtic duct: we have already obſerved, that the hepatico-cyſtic ducts are imaginary; we may add, that if the bladder be removed with its contents, the cyſtic duct tied, and preſſure then applied to the part in every direction, not a particle of the fluid eſcapes. If the cyſtic duct be obſtructed by a calculus, or obliterated by diſeaſe, no bile is contained in the gall-bladder, which, on the contrary, is filled with a colourleſs mucus. If we evacuate the receptacle in a living animal, and tie its duct, it will be found under the ſame circumſtances; and the cyſtic duct, from its opening into the hepatic to the ligature, will be diſtended.

The gall-bladder, from the view of its functions, does not ſeem to be a very important organ in the economy. Several animals, among the mammalia, do not poſſeſs it, as the horſe, ſtag, elephant. No ill effects have been obſerved, where the cyſtic duct has been obliterated; nor where there has been a natural deficiency of the organ.

That the fluid ſecreted in the liver flows in part directly into the inteſtine, would be naturally inferred from obſerving the ſize and favourable direction of the hepatic duct for this courſe, and the comparatively unfavourable direction, tortuous courſe, and ſmall diameter of the paſſage leading into the gall-bladder. Theſe circumſtances, indeed, would lead us to expect that the bile would enter the gall-bladder in very ſparing quantity. If an animal be opened, when the inteſtinal functions are not going on, the hepatic duct, and the ductus choledochus, contain hepatic bile; the ſurface of the duodenum and jejunum is tinged with the ſame kind of fluid; and the gall-bladder is diſtended with cyſtic bile, of which the properties are the more ſtrongly marked in proportion to the length of the previous abſtinence. While the ſtomach is exerting its action on the food, the ſame appearances are exhibited. When the aliment has paſſed into the duodenum, the ductus choledochus contains dark-coloured cyſtic bile, and the gall-bladder is leſs full. At the end of digeſtion, and a little after, the hepatic and common ducts, and the gall-bladder, all contain a light-coloured bile; which is obſerved alſo in the duodenum. The gall-bladder is flaccid. Theſe obſervations are deduced from experiments made by Bichat, and recorded in his Anatomie Generale, p. 459. "They were repeated," ſays he, "a great number of times, and ſhew clearly, that the ſecretion goes on to a certain amount at all times, but that this quantity is increaſed during digeſtion. The bile furniſhed when the action of the inteſtine is not going on, is divided between the inteſtine, which is always coloured by it, and the gall-bladder, which retains it without pouring out any through the cyſtic duct: while it is thus retained, it acquires its acrid character, deep tint, and the properties which ſeem to be required for the purpoſes of the digeſtion that is to enſue. When the food, after undergoing the action of the ſtomach, enters the duodenum, all the hepatic bile flows into the inteſtine, and even in greater quantity than before. The gall-bladder at the ſame time pours out its contents. When the action of the inteſtine is concluded, the quantity of fluid ſecreted by the liver is diminiſhed, and it flows partly into the duodenum, and partly into the gall-bladder, where it is then ſeen in ſmall quantity, and of a bright colour, becauſe there has not yet been ſufficient time for it to be collected more abundantly, nor to acquire a deeper colour." Bichat is of opinion that the ſtomach always contains a certain quantity of bile. "In its empty ſtate," ſays he, "we always find in it more or leſs mucous fluid, ſometimes mixed with ſmall globules of hydrogen gas, and almoſt always tinged of a yellowiſh colour by bile, which has entered through the pylorus. Haller ſays, that this reflux does not always take place; but it is conſtant, according to Morgagni. I have opened no dog where it could not be manifeſtly diſcerned in the empty ſtomach, particularly when it had been long empty. The bodies of perſons, who die of diſeaſe, are not fit for deciding this queſtion, as the diſeaſe may alter the courſe, nature, and colour of the bile. When the ſtomach was full, I could not ſometimes aſcertain the preſence of bile: in other inſtances I obſerved a yellowiſh fluid between the alimentary maſs and the coats of the ſtomach. The bile entering the ſtomach has always appeared to me, from its colour, to be hepatic; I have never ſeen that dark fluid which is contained in the gall-bladder, and which is vomited in ſome diſeaſes. This accords with the obſervation made above, that hepatic bile only enters the duodenum during abſtinence. It is evident that the paſſage of the food from the ſtomach, at the commencement of inteſtinal digeſtion, at which time cyſtic bile certainly flows into the duodenum, muſt prevent that bile from going through the pylorus."

We have mentioned, in the article DIGESTION, the effects produced on the contents of the inteſtine by the admixture of the biliary fluid. On this ſubject, indeed, the amount of our knowledge is very trifling: that the preſence of the fluid is eſſential to the right performance of the inteſtinal functions, and that the colour of the fæces is derived from its admixture, are obvious facts, and they include nearly all that is hitherto proved.

The chemical compoſition of the fluid is conſidered under the article BILE.

The ſympathies of the liver, with other organs, are very numerous and important; and render its phyſiology very intereſting to the phyſician. It is connected primarily or ſecondarily, as cauſe or effect, with various diſorders of the head, cheſt, and abdomen.

LIVER, *Chronic diſeaſes of the*, in *Medicine*.—Having already treated of the *acute* inflammatory affections of the liver (ſee HEPATITIS), and of the various obſtructions to the exit of the bile into the inteſtines, which give riſe to *Jaundice* (ſee that article); it remains for us to deſcribe, in this place, the other morbid changes to which this organ is liable, and which are of a ſlow or *chronic* kind. Theſe are, principally, the ſlow inflammation of the liver, or chronic hepatitis, as it has been called; induration, or a ſcirrhous ſtate of the organ; ſoftneſs of it; enlargement, or diminution of its bulk; the formation of tubercles in it; adheſions of it to the contiguous parts, &c. The formation of thoſe veſicular cyſts, which are denominated *hydatids*, in the liver, has been already diſcuſſed under the general head. See HYDATIDS.

The chronic inflammation of the liver is a diſeaſe, which is more common in this country than the acute; and is often ſo inſidious in its progreſs, and accompanied by ſo few ſymptoms of ſerious indiſpoſition, as to have advanced to a complete ſuppuration, before its exiſtence was ſuſpected. In ſome meaſure, indeed, a ſimilar obſervation applies to all the chronic derangements of the ſubſtance of the liver, which often excite no alarm, by the ſymptoms which might be expected to accompany them, until they are fully formed. The ſlight indiſpoſition that occurs is attributed to indigeſtion, flatulence, or ſome other affection of the ſtomach; the pain of which the patient occaſionally complains is falſely referred to that organ; and its continuance is ſo ſhort, and the degree of it frequently ſo inconſiderable, as to demand but a ſlight attention. The relief obtained by eructation and the diſcharge of air alſo tends to confirm the opinion, that the ſeat of the diſeaſe is in the ſtomach: but this relief may be explained on the principle of removing the diſtention of the ſtomach, and ſo taking off the preſſure of this organ from the liver.

Where this ſlow inflammation and gradual obſtruction is going on in the liver, the patient is ſubject to occaſional pain in the right hypochondrium, extending to the *ſcapulæ*, or to the top of the ſhoulder, a quick pulſe, an increaſe of heat, alternating with chilly ſenſations, difficult breathing on quick motion, ſome difficulty of lying on the left ſide, flatulence, indigeſtion, acidity, coſtiveneſs; and, together with a gradual diminution of ſtrength and fleſh, he has a pale or ſallow complexion. The complexion, indeed, of a perſon affected with chronic obſtruction in the liver, although often not wearing the appearance of jaundice, yet has frequently a peculiar ſallowneſs, or a dirty-greeniſh hue, which Dr. Darwin, from its reſemblance to the colour of a full-grown ſilk-worm, has aptly enough denominated *bombycinous*. The extent and duration of pains, Dr. Saunders obſerves, ariſing from diſeaſe of the liver, are ſo various, as frequently to deceive both the phyſician and patient; they extend to the ſhoulder, ſcapulæ, muſcles of the neck, along the arm, even to the joints of the wriſt. Every change of poſture either relieves an old pain, or induces a new one, as does the mere bending of the body in any direction, or even extending the arms. The pains are greater in a ſupine, than in an erect poſture.

Theſe ſymptoms, and ſome others which make their appearance in the more advanced ſtages, are ſufficient to point out the exiſtence of chronic diſeaſe in the liver: but it is to be regretted, that they are not peculiar to chronic inflammation of the organ; and that the varieties of hepatic obſtruction are not diſtinguiſhed from each other by any particular combinations of ſymptoms; for it muſt be obvious, that the ſame remedies cannot be adminiſtered with advantage in diſeaſes, which are eſſentially ſo different in their nature, as thoſe which we are about to deſcribe.

The term *ſchirrus*, when applied to the liver, has been employed in two acceptations, or at leaſt to denote two different ſtages of a diſeaſe, if not two different diſeaſes: namely, an induration of the ſubſtance of the liver generally, and the formation of the common tubercle in it; the former of which is, in the opinion of Dr. Baillie, the firſt ſtep towards the latter. When an indurated liver is examined by diſſection, no peculiar alteration of ſtructure is obſerved; only the ſubſtance of the gland is found uniformly of a more compact and ſolid conſiſtence, or leſs ſoft and porous, it is ſomewhat diminiſhed in bulk, and the lower edge is bent a little inwards; the colour, too, is ſomewhat paler, in conſequence of a diminiſhed ſecretion of the bile, or of a leſs free admiſſion of blood into the ſubſtance of the organ. Upon the ſurface of ſuch a liver, Dr. Baillie remarks, "there is not uncommonly a thready appearance of membrane, diſpoſed ſomewhat in a radiated form. This, I believe to be the firſt ſtep in the progreſs towards the formation of the common tuberculated liver. I have ſometimes ſeen ſmall tubercles formed upon a part of the ſurface of ſuch a liver, which were exactly of the common ſort, &c. This hardened ſtate of the liver is ſometimes accompanied with a beginning aſcites, and ſometimes is without it." Loc. cit.

Dr. Saunders obſerves, that in theſe caſes of induration of the liver, there is, together with a diminution of bulk, alſo ſome degree of loſs of weight. This, however, he believes, occurs only in the latter ſtages of the diſeaſe, when it is uſually ſeen by the anatomiſt. For, conſidering that the diſeaſe is commonly the reſult of one of the two following cauſes, *viz.* a long reſidence in a hot climate, or the immoderate uſe of ſpirituous liquors, both of which tend to produce an over-excitement of the circulation, and a hurried ſecretion, he deems it moſt probable, nay he is perſuaded, that in the more early ſtages of ſchirroſity, the liver is not only not ſenſibly diminiſhed in bulk, but that there is at that period an increaſe both of bulk and weight, which is followed by a gradual diminution of both. "To produce an increaſed ſecretion of bile," he argues, "it is plain that there muſt be an increaſed action of the branches of the vena portarum, and an acceleration of fluids through thoſe branches: hence a condition of veſſels is induced, approaching in ſome reſpects to that of inflammation; with this difference, that it is an inflammation in which the vein, or ſecreting veſſel, is more concerned, than the artery or nutrient veſſel. The effect of this action, eſpecially when protracted for a conſiderable time, muſt neceſſarily be that of inducing an alteration in the ſtructure of the part; an alteration ſimilar to what obtains in other organs, labouring under indolent and chronic inflammation. This change of ſtructure, from its ſolidity and compactneſs, ſeems to depend on the effuſion of the coagulable lymph into the parenchymatous ſubſtance of the liver; with this peculiarity, that while it is, in active inflammations, depoſited by arteries, it is, in the chronic kind, effuſed by the veins, &c." This effuſion, however, he adds, impedes the ſecretion of bile; and, where a part has loſt the power of performing its functions, the abſorbents often become active, and remove it: whence the diminution of weight as the diſeaſe advances. (Saunders's Treatiſe on Structure and Diſ. of the Liver, 3d edit. p. 282, et ſeq.) At all events, the view of the diſeaſe, which aſcribes the effuſion of the interſticial matter, and the conſequent induration, to a previous excitement of the veſſels and hurried ſecretion, accord both with the general laws of the animal economy, and with the known ordinary cauſes of this diſeaſe.

With reſpect to the other modification of ſchirrous liver; which is one of the moſt common of its diſeaſes, we cannot do better than repeat Dr. Baillie's accurate deſcription. "This diſeaſe," he ſays, "is hardly ever met with in a very young perſon, but frequently takes place in perſons of middle or advanced age: it is likewiſe more common in men than in women. This ſeems to depend upon the habit of drinking being more common in the one ſex than in the other; for this diſeaſe is moſt frequently found in hard drinkers, although we cannot ſee any neceſſary connection between that mode of life and this particular diſeaſe in the liver. It happens, however, very commonly, that we can ſee little connection between cauſe and effect in changes which are going on in every other part of the body.

"The tubercles, which are formed in this diſeaſe, occupy generally the whole maſs of the liver, are placed very near each other, and are of a rounded ſhape. They give an appearance every where of irregularity to its ſurface. When cut into, they are found to conſiſt of a browniſh or yellowiſh-white ſolid matter. They are ſometimes of a very ſmall ſize, ſo as not to be larger than the heads of large pins; but moſt frequently they are as large as ſmall hazel nuts, and many of them are ſometimes larger. When the liver is thus tuberculated, it feels much harder to the touch than natural, and not uncommonly its lower edge is bent a little forwards. Its ſize, however, is generally not larger than in a healthy ſtate, and I think it is often ſmaller. If a ſection of the liver be made in this ſtate, its veſſels ſeem to have a ſmaller diameter than they have naturally. It very frequently happens that in this ſtate the liver is of a yellow colour, ariſing from the bile accumulated in its ſubſtance; and there is alſo water in the cavity of the abdomen, which is yellow, from the mixture of bile. The gall-bladder is generally much contracted, and of a white colour, from its being empty. The bile, from the preſſure of the hard liver upon the *pori biliarii*, does not reach the *ductus hepaticus*, and therefore cannot paſs into the gall-bladder. The colour of the ſkin in ſuch caſes is jaundiced, and it remains permanently ſo, as it depends on a ſtate of liver not liable to change. This is the common appearance of what is generally called a ſchirrous liver: but it bears only a remote reſemblance to *ſchirrus*, as it ſhews itſelf in other parts of the body. I ſhould therefore be diſpoſed to conſider it as a peculiar diſeaſe affecting this *viſcus*." Morbid Anat. chap. ix.

This account of the ſtate of the indurated and tuberculated liver renders it unneceſſary to explain, at any length, the origin of the dropſy, jaundice, &c. which accompany theſe diſeaſes, when inveterate. It muſt be obvious to thoſe who underſtand the ſtructure of the parts, that if ſome bile is ſecreted in the liver, but, from the compreſſed ſtate of the ducts, it cannot paſs into the inteſtines, it will be abſorbed into the circulating blood, and produce jaundice. (See Jaundice.) And dropſy will enſue, in conſequence of the impermeability of many of the blood-veſſels of the liver, which are compreſſed by the ſurrounding tubercles; whence, as in all caſes of ſuch obſtruction to the circulation, the thinner parts of the blood will exude from the exhalant extremities of the over-diſtended veſſels behind. (See Dropsy, *cauſes of*.) From the ſame obſtruction, and the over-diſtention of the venous ſyſtem, theſe veſſels are liable to give way; whence hemorrhagies, or diſcharges of dark blood, are liable to occur, under ſuch morbid ſtates of the liver, from the ſtomach, inteſtines, noſe, and other internal paſſages; but eſpecially from the two former, ſince the blood which circulates through them, as well as through the *ſpleen*, *pancreas*, and *omentum*, muſt paſs through the liver to reach the heart; the circulation, therefore, muſt be particularly impeded in the organs juſt mentioned, when that of the liver is obſtructed; and the blood will force its way through other paſſages, if the veſſels are not ſtrong enough to reſiſt any extraordinary diſtending force.

The liver is liable to be affected with other varieties of tubercle, of a larger ſize than thoſe above deſcribed: Dr. Baillie has mentioned three varieties of theſe, which he calls the large white tubercle, ſoft brown tubercle, and ſcrofulous tubercle. The firſt of theſe, which is by no means ſo frequently met with as the common tubercle, reſembles more nearly the ordinary appearance of ſchirrus in other parts of the body. Theſe tubercles are hard whitiſh maſſes, of a globular form, and firm opaque ſubſtance, often as large as a cheſnut, and ſometimes much larger, or on the other hand, conſiderably ſmaller. "They are to be found near the ſurface of the liver," Dr. Baillie obſerves, "in greater number, than near the middle of its ſubſtance: two or three frequently lie contiguous to each other, with a conſiderable portion of the liver, in a healthy ſtate, interpoſed between them and a cluſter of ſimilar tubercles. The liver in this diſeaſe is frequently a good deal enlarged beyond its natural ſize." Dr. Baillie adds, that "theſe tubercles appear to be firſt formed round the blood-veſſels of the liver, as is ſeen in making ſections of a liver in this ſtate. While the liver is under ſuch circumſtances of diſeaſe, there is ſometimes water in the cavity of the abdomen, and ſometimes none; the liver is ſometimes tinged in its colour, from the accumulation of bile, and ſometimes the colour of its ſubſtance, between the tubercles, is perfectly natural." (Loc. cit.) The two other ſpecies of tubercle are very rare; the one conſiſts of a ſmooth, ſoft, browniſh matter, the nature of which is not thoroughly known; the other bears a ſtrong reſemblance to the tubercle of the lungs. See Consumption.

There are no peculiar ſymptoms, by which the exiſtence of theſe different tubercles can be diſcriminated in the living body. When the parietes of the abdomen are thin, and there is little dropſy, and eſpecially when the liver is enlarged, the tubercles can ſometimes be diſtinctly felt by the fingers, upon an attentive examination, along the lower edge of the viſcus. Dr. Baillie correctly ſtates, that the large white tubercle is not ſo often attended with jaundice and aſcites as the common tubercle. We witneſſed the exemplification of theſe obſervations, in a ſtriking inſtance, ſome years ago; in which a woman, addicted to ſpirit-drinking, had been affected with the large tubercle of the liver for ſeveral years, but had complained only of loſs of appetite, and occaſional ſickneſs and pains in the ſide, had been pregnant and brought forth twins, and never had any appearance of dropſy to the laſt, nor of a jaundiced complexion, until within eight days of her death. Yet in this perſon, the liver was not only found about three times its natural bulk, (filling half the cavity of the belly, and being diſtinctly felt, before death, extending down the *umbilicus*, and thence to the ſpine of the *pelvis*,) but appeared, on making a ſection, to conſiſt of a mere maſs of tubercles, with ſome looſe interſticial matter, but without any ſemblance of the natural ſubſtance of the viſcus. The ſection preſented an appearance not unlike the pudding-ſtone of mineralogiſts. It would ſeem that, from the laxity of the intervening ſubſtance between the tubercles, the circulation through the branches of the *vena portæ* was not materially impeded; and hence no dropſical effuſion took place from the veſſels of the peritoneal viſcera. The patient was confined to bed only eight days, and was apparently cut off by an inceſſant agoniſing pain in the diſeaſed organ, which firſt induced delirium, and afterwards wore out the powers of life.

The liver is not unuſually found ſofter and much more flaccid in its ſubſtance than natural, without any other appearance of diſeaſe. It feels, in ſuch inſtances, nearly as ſoft as the ſpleen, and is commonly of a leaden colour. This ſtate of liver is ſeldom, if ever, found in young perſons; moſt commonly in perſons advanced in life. Some other rare morbid changes have alſo been ſeen in the liver; ſuch as the converſion of part of its coats into cartilage, and the formation of cartilaginous cyſts in its ſubſtance, containing an earthy matter of a ſoft ſmooth quality, and browniſh-white colour.

It is not unuſual, on diſſection, to ſee adheſions formed between the liver and the contiguous parts, which are the conſequence of a previous inflammation in the membrane covering the liver. Theſe adheſions are formed from the coagulable lymph of the blood, which undergoes a gradual proceſs of elongation from the motion of the parts, ſo as to produce little inconvenience, and in ſome circumſtances of diſeaſe much advantage. They conſiſt very commonly of a thin tranſparent membrane, which joins the ſurface of the liver to the neighbouring parts. This junction may either be general over one extended ſurface of the liver, or it may conſiſt of a number of proceſſes of adheſion: the adheſion is ſometimes by a membrane of conſiderable length; and ſometimes it is very cloſe, the ſurface of the liver being immediately applied to the neighbouring parts. Theſe adheſions are moſt commonly found on the anterior ſurface of the liver, by which it is joined to the *peritonæum* lining the muſcles at the upper part of the cavity of the abdomen. When an abſceſs is formed in the ſubſtance of the liver, and points externally, theſe adheſions are of great uſe in preventing the *pus* from eſcaping into the general cavity of the abdomen. Adheſions are alſo frequently found connecting the poſterior ſurface of the liver to the ſtomach and the *duodenum:* and theſe may alſo be uſeful in abſceſſes of the liver, near its poſterior ſurface, by preventing the matter from paſſing into the general cavity of the abdomen, and conducting it either into the ſtomach, or the upper part of the inteſtinal canal. See HEPATITIS.

Profeſſor Portal of Paris, an able and ſedulous cultivator of morbid anatomy and medicine, has pointed out ſome difficulties in forming an accurate diagnoſis, between diſeaſes of the liver and of ſome of the neighbouring organs, eſpecially of the lungs. On the one hand, he obſerves, that obſtructions and congeſtions in the right lobe of the lungs, and the right cavity of the cheſt, ſometimes occaſion ſuch an alteration in the ſituation of the liver, by preſſing down the diaphragm, as to produce a ſuſpicion of diſeaſe in it, by occaſioning the appearance of a tumour in the right hypochondrium. He relates a caſe of this ſort, in which he was deceived, by this apparent tumour, in a patient who died of pulmonary conſumption, where little or no expectoration took place: and he cautions practitioners not to be miſled by ſuch an appearance, which is common in all congeſtions of the cheſt. He affirms, too, that a degree of jaundice is occaſionally produced, where the bile has free paſſage into the inteſtines, but is there detained, in conſequence of mechanical impediments, as *volvulus*, ſtrangulated *hernia*, accumulations of hardened fæces, &c. when it is taken up by the lacteals, and enters the blood-veſſels. On the other hand, he remarks, if we ſometimes attribute diſeaſes to the liver, which have their ſeat elſewhere, there are other maladies, actually ſeated in the liver, which are frequently aſcribed to other organs. Thus the contiguous *viſcera*, ſuch as the right kidney, the diaphragm, the lungs, the ſtomach, and the colon, are ſometimes ſuppoſed to be affected with diſeaſe, which is ſeated excluſively in the liver. Many examples of this are to be found in the writings of Morgagni and Lieutaud. Mr. Portal relates two caſes of ſevere and continued vomiting, connected with diſeaſed liver, the firſt of which proved fatal; and the other was cured, in conſequence of the leſſon taught by the previous diſſection. An enlargement of the liver was felt externally, with great tenderneſs in the epigaſtrium. See Mem. de l'Acad. des Sciences, Ann. 1777; or Mem. ſur pluſieurs Maladies, par Ant. Portal, tom. i. p. 228.

Where there is evidence of the exiſtence of a conſiderable degree of diſeaſe in the liver, the prognoſtic muſt be always unfavourable, on the whole: for, in the firſt place, it is extremely difficult to aſcertain the exact ſtate of the organ; and, ſecondly, if we actually knew it, the moſt judicious application of the moſt powerful remedies would be unequal ſometimes to remove the diſeaſe. The moſt favourable ſymptoms are, an improvement in the complexion, the ſtrength remaining unimpaired by the action of the medicines, and a return of appetite. Dr. Pemberton thinks that if the patient decidedly gains bulk in the ſolids of the body, you may ſafely pronounce that he will recover. The moſt unfavourable ſymptoms are, the colour of the ſkin remaining the ſame, or becoming more ſallow, the general ſtrength being much diminiſhed, the abdomen beginning to ſwell, and the patient loſing bulk in the upper extremities, while the lower become more enlarged. Pemberton on Diſ. of the Abdom. Viſcera, p. 43.

When the liver is ſo far diſeaſed as to have become ſchirrous, tubercular, or in any other way much altered in its ſtructure, it muſt be obvious that medicine cannot effect any eſſential change. The treatment, therefore, which is to be recommended muſt be conſidered as applying to that ſtage of diſeaſe, which precedes any extenſive organic alteration. It is not improbable, as Dr. Saunders ſuggeſts, that the original miſchief is commonly in the ſtomach and bowels, and that the liver becomes diſeaſed by ſympathy: for dyſpeptic complaints generally precede the chronic affections of the liver; and they are induced by intemperance in eating or drinking, but particularly by the abuſe of vinous and ſpirituous liquors, by long faſting, by a ſedentary mode of life, by grief and anxiety of mind, &c. (See DYSPEPSIA.) Whatever weakens the digeſtive powers of the ſtomach, Dr. Saunders maintains, ultimately weakens alſo the power of the liver, and diminiſhes the ſecretion of bile. (Saunders on the Liver, p. 192.) And again, he conſiders the diminiſhed ſecretion of bile, or its diminiſhed protruſion into the *duodenum*, (which he aſcribes to an hypothetical conſtriction of the bile-ducts,) as reciprocally acting upon the ſtomach, and weakening its tone. One proof of the exiſtence of the ſuppoſed ſpaſmodic conſtriction of the orifice of the common duct he deduces from an obſervation, that, in a fit of ſick head-ache, if bile is brought into the ſtomach, and thence ejected, by the violent ſtraining to vomit, the termination of the fit is much more ſpeedy and complete than when this does not happen.

When the diminiſhed or altered ſecretion of the bile, then, is preceded by affections of the ſtomach, ſuch as loſs of appetite, indigeſtion, and flatulent eructations, the diet of the patient ſhould be attentively regulated, the art of cookery ſhould be rendered merely ſubſervient to digeſtion, and the preparation of healthy chyle; and the general regimen ſhould be ſuch as has been already recommended in diſorders of the digeſtive organs. (See INDIGESTION.) The quantity of food taken at one time ſhould be moderate, and water ſhould be the only liquid drunk with the meals, as more effectually promoting digeſtion than fermented liquors of any kind. All raw or unboiled vegetables ſhould be avoided; but ripe fruits may be moderately taken, and almoſt all boiled vegetables admitted. Animal food ſhould be well boiled, or moderately roaſted, and taken with its own gravy. Pye-cruſt, every thing fried, butter rendered rancid by being melted, &c. ſhould be cautiouſly avoided. The patient ſhould uſe regular and moderate exerciſe.

It is of the higheſt importance, in order to keep up a due ſecretion of the bile, to adminiſter a ſucceſſion of gently purgative medicines. Upon this principle, the benefits ariſing from the waters of Cheltenham (which cannot be too highly recommended in theſe complaints) are obviouſly to be explained. Nevertheleſs, ſo far as the mere operation of theſe waters is concerned, no good reaſon can be aſſigned for any ſuperior efficacy to be expected from them rather than from the adminiſtration of an equally active doſe of the ſulphate of magneſia, or other ſaline laxatives, diſſolved in a proper quantity of water. Three drams of this ſalt in half a pint of fluid, as in the Seidlitz water prepared by N. Paul and Co., may be taken every morning, or every other morning, according to the ſtrength and ſtate of bowels of the patient. The regularity, temperance, and exerciſe, and likewiſe the abſence of the anxieties of buſineſs, which contribute materially to aſſiſt the beneficial influence of thoſe waters, when drunk at the ſprings, ſhould, however, be conjoined with the employment of theſe ſubſtitutes at home.

In the chronic derangements of the liver, producing a diminiſhed ſecretion of bile, and particularly when ſuch affections have ariſen from inflammation, mercury has been found one of the moſt effectual remedies. It is only, however, in the chronic ſtate of inflammation that this remedy is adminiſtered with advantage. But the ſucceſs of it, in theſe caſes, has led perhaps to an empirical practice, of exhibiting it without ſufficient diſcrimination between inflammations of a more indolent, and thoſe of a more active nature, on the one hand, and between inflammation and the tuberculated ſtate, &c. on the other. But, as Dr. Saunders remarks, to exhibit a medicine without due diſcrimination, is to abuſe it, and at length to bring it into contempt and neglect. And this fate may perhaps await the uſe of mercury in complaints of the liver, if, by a blind empirical adminiſtration of it, it be incautiouſly employed in the *active* periods of inflammation, when, from its ſtimulant properties, it appears better calculated to accelerate than to retard the ſuppurative proceſs. But upon this point we have enlarged, when treating of the cure of HEPATITIS; and ſhall now only repeat, that it is in the chronic ſtate of inflammation alone, that the exhibition of mercury can be reſorted to with benefit; for it now acts as a ſpur upon the vaſcular ſyſtem of the liver, and, by its moderately ſtimulating effects, occaſions at length a degree of action, by which the bile is properly elaborated, and health gradually reſtored.

That a great variety of complaints, both local and general, which have been comprehended under the terms nervous, hypochondriacal, bilious diſeaſes, &c. originate from diminiſhed ſecretion of bile, which, under ſuch diminution in quantity, is alſo liable to be vitiated in quality, practitioners are again coming to admit. By obſerving phyſicians of all times, indeed, this general fact had been noticed; and upon it, a principal part of the ancient humoral pathology, which aſcribed thoſe diſeaſes to the prevalence of *bile* and *black bile*, was founded. We cannot now, with all the additional lights afforded by a better cultivation of anatomy, phyſiology, and the collateral ſciences, lay down a perfect theory of the ſubject. A learned and ingenious phyſician to Guy's Hoſpital has long inveſtigated the point, and has long been pledged to lay the reſult of his practical inquiries before the public. They have not, however, yet appeared. But from the publication of a ſmall pamphlet, as the precurſor of his volume, it would appear that he has ſatisfied himſelf, both with reſpect to certain means of practical diſcrimination, and as to the mode of operation of the mercurial remedies. It would ſeem, from this pamphlet, that the author conſiders moſt of theſe diſeaſes as dependent on a conſtricted or obſtructed ſtate of the hepatic ducts, and mercury, adminiſtered in ſmall doſes, and in its milder forms, as poſſeſſing the property of "emulging" the ducts, eſpecially when irritation about the parts is ſoothed by opiates: in other words, that theſe mercurials are, in the ſtrict ſenſe of the word, *cholagogues*. After having deſcribed the caſe of a delicate female, affected with great irregularity of bowels, terminating in dyſentery, and accompanied with paleneſs, languor, dejection of ſpirits, loſs of appetite, quick ſmall pulſe, &c. which had been rather augmented than relieved, by repeated doſes of calomel and rhubarb, alternated with opiates, and which yielded to ſmall doſes of the *pilula hydrargyri*, preceded by an opiate, and followed by a doſe of caſtor-oil;—he thus ſtates his view of the diſeaſe, and of the *modus operandi* of theſe remedies. "The depreſſed action of the brain which anxiety occaſions, produced a correſponding defect of action in the liver; whence the inteſtines, from not being ſupplied with bile in ſufficient quantity, or healthy in quality, became irritated by the food paſſing through them in an undigeſted ſtate. The purgatives, aſtringents, and opiates, which were firſt employed, gave temporary relief, but left the *ſource* of the diſorder as it was; whilſt the calomel, acting merely as a ſimple evacuant, carried off nothing but the exiſting contents of the inteſtines, and ſtill farther weakened their tone. But, by allaying inteſtinal irritation by opium, then relaxing the hepatic ducts by the *pil. hydrargyri*, and laſtly, emulging them by the aid of a mild cathartic, the order of nature was reſtored, and that harmony of function between theſe parts, which is neceſſary to health, completely eſtabliſhed." (See An Examination of the Prejudices commonly entertained againſt Mercury, &c. by James Curry, M.D., &c. 2d edit. p. 20, note. Lond. 1810.) This explanation of the alleviation of the diſeaſe is ſufficiently plauſible; it is, however, but an hypotheſis; for the previous *conſtriction*, the ſubſequent *relaxation*, and the ultimate *emulging* of the biliary ducts, are incapable of demonſtration; neither is the firſt aſſumed circumſtance adequate to explain the altered quality of the bile, nor the two latter its changes to the healthy ſtate. It is ſufficient, however, if it be practically aſcertained, that this mode of mercurials, preceded or combined with anodynes, and followed by gentle cathartics, is an efficient mode of treatment in theſe caſes of diminiſhed or vitiated ſecretion of bile.

In thoſe caſes of diſeaſed liver, which have been ſometimes denominated ſchirrous, when, either from previous acute inflammation, or from frequent accelerated ſecretion of bile, during a long reſidence in a warm climate, the veſſels of the liver have poured out, into the parenchymatous ſubſtance, ſo much coagulable lymph, as to render it firm and indurated,—then it is often neceſſary to puſh the uſe of mercury farther, ſo as to produce a gentle ſalivation, which, when kept up for a length of time, often effects a cure, by promoting abſorption. In the exhibition of mercury for this purpoſe, a preference has been given to its introduction by friction on the ſkin, through the cutaneous abſorbents; and the part on which the mercurial ointment has been rubbed is the right *hypochondrium*, from a notion of its efficacy being greater when applied to the vicinity of the diſeaſed organ. But it is pretty obvious, that, except in ſo far as friction may ſerve the purpoſe of gentle exerciſe to the part, and thus aſſiſt in emulging the biliary ducts, there is no material advantage derived from this; and that it is of little importance what part is made choice of, provided the effects produced on the general ſyſtem be equally ſtrong. The knowledge derived from anatomy reſpecting the ſtructure, origin, and direction of the abſorbent veſſels, ſufficiently proves that, whether uſed internally, or introduced by external friction, none of the mercury can be made to paſs through the liver in its way into the conſtitution: it cannot, therefore, act on the liver, but by being firſt introduced into the blood-veſſels. Such parts of the body as have the fineſt cuticle, as in the inſide of the thighs, between the fingers, in the groin, &c. which afford the beſt abſorbing ſurface, ſhould be choſen for the purpoſe of the friction.

On the other hand, the tuberculated ſtate of the liver is perhaps always beyond the power of mercury to alleviate, and often it would ſeem even aggravated by its exhibition. Medicine may contribute greatly to relieve diſtreſſing ſymptoms, in ſuch caſes, but cannot be expected to change the morbid ſtructure. Flatulence, pains in the ſides, ſtomach, and belly, indigeſtion, &c. may be greatly diminiſhed by laxatives, abſorbents, gentle tonics, and occaſional antiſpaſmodics; and the digeſtion may be favoured by the choice of light diet, taken in moderate quantities. But it cannot be expected that the ſyſtem ſhall be put under the ſtimulus of a mercurial courſe with impunity, much leſs with advantage, under ſuch circumſtances.

Liver, *Infarctions of the.* See HEPATITIS *Infarctio.*

Liver, in *Antiquity*, was much uſed in divination. See Hepatoscopia.

Liver *of Antimony*, in *Chemiſtry*, reſults from the detonation of antimony with an equal weight of nitre. Theſe two matters reduced into powder are to be mixed together, and put into a large crucible. The maſs is then to be kindled, and the detonation to be made. When it has detonated it is to be kept in fuſion, and then cooled. When the crucible is broken, at the bottom two diſtinct matters are found, which may be ſeparated from each other by the ſtroke of a hammer. The upper matter is a ſaline ſcoria, nearly of the ſame nature as the ſcoria of the regulus of antimony. This is a true antimonial liver of ſulphur, mixed with a certain quantity of vitriolated tartar. The lower matter is heavier. It is opaque, compact, red, and brittle. This is the liver of antimony. Its colour and appearances have been ſuppoſed ſimilar to thoſe of the livers of animals, whence its name. It is principally compoſed of the metallic part of antimony, half deprived of its ſulphur, and dephlogiſticated by nitre. This ſubſtance is of no uſe in chemiſtry, nor in medicine, ſince the kermes mineral and emetic tartar have been introduced. Macquer's Chem. Dict. See Antimony.

Liver *of Arſenic*, is a combination of white arſenic with liquid fixed vegetable alkali, or by the humid way. The operation for making liver of arſenic is eaſy and ſimple: to ſtrong and concentrated liquid fixed alkali, previouſly heated, fine powder of white arſenic muſt be added, till the alkali is ſaturated, or has loſt its alkaline properties. While the alkali diſſolves the arſenic, it acquires a browniſh colour, and a ſingularly diſagreeable ſmell; and the mixture gradually thickens into a gluey conſiſtence. Chem. Dict. See Arsenic.

Liver *of Sulphur* is the combination of ſulphur with alkaline matters: and this combination may be made either in the dry or humid way. In the dry way, or by fuſion, a mixture of equal parts of fixed alkali and ſulphur is put into a crucible, and quickly fuſed. The melted maſs is then poured on a greaſed ſtone, and then the liver of ſulphur congeals and acquires a brown colour. If it be required to be kept dry, it muſt be ſoon broken to pieces, and put, while it is hot, in a bottle well corked, becauſe it readily imbibes moiſture from the air. In the humid way, which is leſs common, concentrated liquid fixed alkali, and fine powder of ſulphur, are to be boiled together, till the alkali has diſſolved as much as it can: the liquor is then to be filtrated and evaporated.

Liver of ſulphur is an important combination in chemiſtry, becauſe it is in general a very powerful ſolvent of metallic matters; to all which, excepting zinc, it attaches, particularly in fuſion. It ſeems to diſſolve gold more effectually than other metals. It diſſolves alſo vegetable coals even by the humid way: and the ſolution is of a green colour. Particular kinds of livers of ſulphur may be formed by the combination of volatile alkali, of quick-lime, or of abſorbent earths, all which attack ſulphur more or leſs. Chem. Dict. See Sulphur.

M. Navier has lately diſcovered, that the liver of ſulphur, and particularly of liver of ſulphur of Mars, hath the moſt ſalutary effects as an antidote againſt arſenic, corroſive ſublimate, verdigris, and lead. Nav. Contre Poiſons de l'Arſenic, &c. 1777. See Lead.

Liver-*ſtone* See Lapis *Hepaticus*.

Liver-*wort*, in *Botany*. See Lichen.

Liver-*wort*, *Noble*, *Hepatica*, a ſpecies of the anemone.

LIVERMORE, in *Geography*, a town of America, in Cumberland county, Maine, ſituated on both ſides of Androſcoggin river; 19 miles N.W. of Hallowell, and containing 863 inhabitants.

LIVERNON, a town of France, in the department of the Lot, and chief place of a canton, in the diſtrict of Figeac; eight miles W.N.W. of Figeac. The place contains 713, and the canton 7786 inhabitants, on a territory of 285 kiliometres, in 17 communes.

LIVERPOOL, a market town, borough, and ſea-port, in the county palatine of Lancaſter, England. It is placed on the eaſtern bank of the river Merſey, which flows into the Iriſh ſea, not far north of Liverpool. The population of this town, according to the parliamentary returns of 1800, amounted to 77,653 perſons, who occupied 11,446 houſes.

The etymology of the word Liverpool is much involved in obſcurity, though many ingenious antiquaries have endeavoured to aſcertain it. The moſt general opinion is, that it owes its origin to a ſpecies of bird called the *lever*, great flocks of which are ſaid to have frequented a pool in this neighbourhood, during their wanderings from their native climes. Accordingly a bird has, from time immemorial, been the impreſſion on the corporation ſeal. The early hiſtory of this town is equally as unknown as the derivation of its name. Fortunately, however, the deficiency of records concerning it cannot be felt as a great loſs, as there ſeems little reaſon to ſuppoſe it was of any importance, either commercially or politically, previous to the commencement of the laſt century; hence it may be called a modern town.

> "Yet ſcarce an hundred annual rounds have run,
> Since firſt the fabric of this power begun;
> His noble waves inglorious, Merſey roll'd,
> Nor felt his waves by labouring art control'd.
> Along his ſides a few ſmall cots were ſpread,
> His finny brood their humble tenants fed."
> Mount-Pleaſant, a poem by Roſcoe.

To the active, perſevering, and liberal conduct of the author of theſe lines, Liverpool is materially indebted for its preſent increaſe of buildings, commerce, &c. and it would have reflected credit on the free burgeſſes of the town, had they continued to elect him their member.

In the Conqueror's ſurvey, it is ſtated, that all the land between the rivers Ribble and Merſey belonged to Roger de Poictiers; but there is no mention either of a town or village. Hence it may be reaſonably ſuppoſed none exiſted at this time. A caſtle, however, is noticed by Camden, as having been built ſhortly after the conqueſt, the command of which was beſtowed on Vivian de Molyneaux, a Frenchman, in whoſe family it continued till the 30th year of the reign of queen Elizabeth.

Neither hiſtory nor tradition determine any thing certain, either concerning its founder or the period of its erection.

The tower, which forms part of a priſon in Water-ſtreet, is the only building of antiquity which Liverpool can now boaſt of poſſeſſing. The original founder of this tower we are as ignorant of as we are of the founder of the caſtle. Seacombe, in his Memoirs of the Stanley family, is the firſt author who mentions it. He tells us, that it was the property of ſir Thomas Latham, in the reign of Edward III., whoſe daughter and heireſs married ſir John Stanley; but ſays nothing of its erection. The croſs which formerly ſtood at the corner of Pinfold lane, oppoſite the Flaſhes, has been long demoliſhed. This tradition reports to have been placed there in commemoration of St. Patrick, who, it is ſaid, reſted in this neighbourhood on his way from England to Ireland.

The firſt charter in favour of Liverpool, according to Enfield, who publiſhed a hiſtory of Liverpool, was executed in the reign of Henry I., but the accuracy of this ſtatement is extremely doubtful. It is certain, however, that in the charter granted by king John in 1203, nearly a century afterwards, this town is called a borough by preſcription. Henry III. confirmed the privileges of the corporation in the year 1227. From this period to 1555, we are totally in the dark as to its hiſtory or condition; nor is there any thing worth remarking for the 16 years following, when the inhabitants ſent a memorial to queen Elizabeth, praying relief from a ſubſidy which her miniſters had impoſed upon them. In this petition they ſtyle themſelves "her majeſty's poor decayed town of Liverpool." How the town became ſo "decayed," it is now difficult to comprehend, as, from the records ſeveral years previous, it does not ſeem to have been any better than a fiſhing hamlet, containing about 138 houſeholders and cottagers, and poſſeſſing 12 barks, navigated by 75 men. Camden, however, who wrote in 1586, conſidered it in his time as more famous for its beauty and populouſneſs than for its antiquities. To reconcile theſe oppoſite ſtatements, it is only neceſſary to admit, that a very trifling village may arrive at conſiderable opulence in the ſhort period of 21 years; and who will deny the poſſibility of ſuch an event at the preſent day? From Camden's time nothing is recorded of Liverpool deſerving of notice till the year 1644; when the town and its caſtle were poſſeſſed by the parliamentary troops, under colonel Moore. It was fortified and ſecured on the land ſide by a high mud wall, and a ditch twelve yards wide and three deep. Batteries were erected at different points, and the ends of the ſtreets were defended by artillery. The garriſon was numerous, and being well ſtored with proviſions, made a moſt vigorous defence for the ſpace of a month. At laſt, however, the king's army, under the orders of prince Rupert, ſucceeded in taking the town, when the caſtle ſurrendered without further reſiſtance. Some traces of this ſiege can yet be diſcovered at different points. When the foundation of the preſent infirmary was ſunk, the marks of trenches were diſtinctly viſible, and many articles of modern warfare were found within their ſcope. A few years ago, as ſome workmen were removing the earth in a field where Glouceſter-ſtreet now ſtands, they laid open the foundation of a battery, and diſcovered military utenſils of different kinds. From the time of the ſiege till 1680, we have a tolerable account of the progreſs of the town in extent and population. After this period, however, we are again left in obſcurity, and receive no authentic information on that head till the year 1765, when we find a plan of the town made by Mr. John Eyes. About this time, ſays Enfield, Liverpool contained about 4200 houſes, and 25,000 inhabitants. It had, in the interval laſt-mentioned, been conſtituted a diſtinct pariſh from that of Walton, to which its church had formerly been only a dependent chapel. This event took place in 1698, when the inhabitants were likewiſe authoriſed to build a ſecond church. Thus emancipated from parochial ſubſerviency, Liverpool began to diſplay its energies. In the ſhort ſpace of little more than half a century, this town, aided by a few favourable circumſtances, has riſen to great commercial importance, and may be conſidered to be next to the metropolis itſelf. She firſt rivalled, and latterly ſurpaſſed, Briſtol, which had long been conſidered as the weſtern emporium of trade.

The following table exhibits the progreſſive increaſe of the dock duties for ſeveral years, and ſerves to diſplay the vaſt and rapid increaſe of the commerce of the town. It ſhews the number of veſſels that have been aſſeſſed in each year, with the aggregate ſum paid to the dock companies.

Years.	*Ships.*	*£.*	*s.*	*d.*
1760	1245	2,330	6	7
1765	1930	3,455	8	4
1770	2073	4,142	17	2
1775	2291	5,384	4	9
1780	2261	3,528	7	9
1785	3429	8,411	5	3
1790	4223	10,037	6	2
1795	3948	19,368	16	4
1800	4746	23,337	13	6
1802	4781	28,192	9	10
1805	4618	33,364	13	1
1807	5791	62,831	5	10
1809	6023	97,580	19	3

The boundaries of Liverpool extend conſiderably beyond the town in different directions. Theſe are marked out by ſtones called by the inhabitants meer-ſtones, and the ground contained within them is denominated the liberties. The extent of the liberties from eaſt to weſt, is ſomewhat more than a mile and two furlongs, and from north to ſouth conſiderably above two miles. This town exhibits, in general, the appearance of opulence and refinement. The ſtreets are well paved, and during winter tolerably furniſhed with lamps. Of late years it has received many great alterations and improvements, which ſtill continue to proceed notwithſtanding the preſſure of the times. In the year 1790, it conſiſted of 8865 houſes, but their number now is little ſhort of 13,000.

Liverpool poſſeſſes fifteen churches belonging to the eſtabliſhment, ſome of which are worthy the particular attention of the ſtranger. Near the old church, which is dedicated to our Lady and St. Nicholas, there formerly ſtood an image of the latter, to which the ſailors were accuſtomed to make offerings on going to ſea. This church has been lately rebuilt. The tower of St. Peter's, which was erected in 1704, is a well-proportioned octagon, each ſide of the angles having a candleſtick and gilt vaſe repreſenting a flame. This and St. Nicholas are the pariſh churches, and have two rectors over them. The church of St. George, built on the ſcite of the ancient caſtle already mentioned, is a fine edifice of the Doric order, crowned with an attic wall, and adorned with a variety of vaſes. On each ſide is a terrace with receſſes underneath. The interior is handſomely fitted up, the fronts of the galleries being mahogany. This is the mayor's chapel, where he attends every Sunday, and where pews are appropriated for the gentlemen, including ſtrangers, who chooſe to accompany him. St. Thomas's church is of the Ionic order, and has a handſome appearance. It was conſecrated in 1750. St. Paul's church was erected by the town in 1769. At the weſt end is a portico with a pediment, having in the centre, on an octagonal baſe, a dome with a lanthorn, ball, and croſs. The interior is ſupported by eight Ionic pillars. The altar is plain and neat. The church dedicated to St. Ann, on the road to Everton, is a neat building of brick and ſtone. It was erected at the joint expence of two private gentlemen. It has a tower decorated with pinnacles. St. John's church is a new building of ſtone, with a tower. St. Mary's and the other churches have nothing connected with their ſtructures or appearances deſerving of particular notice; though all of them are entitled to be called neat. Beſides the places of worſhip belonging to the eſtabliſhment, there are a great number of diſſenting meeting houſes, or chapels, for various deſcriptions of religioniſts.

The public edifices connected with the trade and commerce of the town are, the exchange buildings, town-hall and manſion houſe, cuſtom-houſe, corn exchange, tobacco warehouſe, and other warehouſes. Of theſe the Liverpool exchange is the moſt ſpacious in plan, and ornamental in its exterior architecture. It has been erected by a ſubſcription of 80,000*l.* raiſed by 800 transferable ſhares. The buildings occupy three ſides of a quadrangle, having the town-hall on the ſouth ſide. The whole ſurrounds an area of 194 feet by 180. It has been Built by John Forſter, eſq. (architect, engineer, and dock maſter to the corporation) from deſigns by James Wyatt, eſq. architect; and is appropriated to a public exchange rooms, coffee rooms, and various offices. The town-hall, formerly called the exchange, is a large inſulated pile of building, the greater part of which was erected in 1750, from the deſigns of Wood of Bath. The whole of its interior was burnt in 1795. It was ſoon repaired, and appropriated to the uſe of the mayor, for offices belonging to the corporation, ſeſſions rooms, &c.

The infirmary is another excellent building of brick ornamented with ſtone. This eſtabliſhment not only extends to all proper objects within Liverpool, but to every perſon whom ſickneſs or bodily misfortune may lead to apply, provided they are recommended by a ſubſcriber. The ſeamen's hoſpital forms a portion of the buildings of this infirmary, being attached to it by a handſome colonnade. The blue-coat hoſpital is placed in an airy ſituation adjoining to St. Peter's church-yard. It is a large handſome building of brick ornamented with ſtone. The number of perſons who annually receive the benefits of this charity are about 280. The expence of this inſtitution is defrayed chiefly by benefactions.

The poor-houſe is a handſome edifice, 90 feet long and 24 broad, built in a plain ſtyle, and in a manner very ſuitable to its uſe. On the eaſt ſide of this ſtructure is a handſome ſtone building, called the "recovery ward," where perſons infected with fevers, and coming under the cognizance of phyſicians and ſurgeons of the diſpenſary, are received. A variety of alms-houſes range out on both ſides of the poor-houſe. In Church-ſtreet is the diſpenſary, which is a very good brick building, with a large circular portico, and having in front a ſmall bas-relief of the good Samaritan. This inſtitution is conducted by a preſident, two auditors, ſeven phyſicians, three ſurgeons, and one apothecary, who officiates as ſecretary. Two phyſicians and a ſurgeon attend every day at certain hours. About 10,000 perſons are ſaid to receive medicine and advice here annually. The Lunatic-aſylum is contiguous to the infirmary, but, like moſt other inſtitutions of the kind, cannot be called a complete charity, as patients are not admitted free of expence. At the entrance into the town, on the road leading from Preſcot, ſtands the ſchool of induſtry for the indigent blind. The original projector was Mr. John Chriſtie, who was himſelf unfortunately deprived of his ſight at the age of 19. In this ſchool pupils are taught various trades, which enable many of them to make a comfortable proviſion for life. Beſides theſe charitable inſtitutions there are a number of others, under different names, intended for the relief of different deſcriptions of perſons, which the limits of an article like this will not permit us to mention particularly.

Liverpool abounds, as may be ſuppoſed from its great trade, with rooms appropriated for public correſpondence, and the tranſacting of buſineſs. The Atheneum, which compriſes a news-room, a library, &c. is ſituated on the ſouth ſide of Church-ſtreet, and is a handſome building of ſtone. The ſubſcribers to this inſtitution, about 450 in number, are ſupplied with the London and provincial newſpapers, the ſhipping and trade liſts, and various periodical publications. Every ſubſcriber is allowed the privilege of introducing his friend, provided he be a non-reſident of the town. There alſo ſeveral more inſtitutions of a ſimilar kind in different parts of the town. Of theſe, the Lyceum is the firſt and moſt worthy of attention. It is ſituated at the bottom of Bold-ſtreet, and is another remarkable inſtance of the munificence and public ſpirit of Liverpool. An academy, for the encouragement of the fine arts, has recently been eſtabliſhed in this town. The places of public amuſement are now little inferior to thoſe in the metropolis. The theatre is a ſpacious and commodious building, and but little inferior to that of Covent-garden in the extent of its ſtage. It generally opens at the time the London houſes ſhut, when many of the firſt performers reſort to it. In Bold-ſtreet ſtands the Muſic-hall, which was opened in 1785. It is a large building, finiſhed with great elegance. The new priſon, according to the Howardian plan for ſolitary confinement, is on a very extenſive ſcale, and has every poſſible convenience.

Liverpool abounds in docks for the ſafety and repair of its numerous ſhipping. The firſt dock was conſtructed here in 1710. Its ſcite was the pool, from which the town derived the latter portion of its name. This baſon of water is called the old dock, and is principally the receptacle of Weſt India and African ſhips, being contiguous to the warehouſes of the merchants engaged in thoſe branches of commerce. The King's dock is 290 yards in length, and 90 wide. On the eaſt ſide of this dock ſtands the tobacco warehouſe, where that article is lodged by the cuſtom-houſe officers till the duties are paid. It was erected by the corporation, and is rented by government at 500*l. per annum.* St. George's dock was the third made in Liverpool. It is about 250 yards long, and 100 broad; and is eſteemed commodious. The largeſt, laſt conſtructed, and beſt finiſhed however of the Liverpool docks, is the Queen's dock, which is ſituated at the bottom of Parliament-ſtreet. Salt-houſe dock, which is the ſecond oldeſt of the whole, compriſes an area of 21,928 ſquare yards; and has a length of quay of 640 yards. Beſides theſe there are five graving docks, and three dry docks, independent of a ſmall one, which belongs to the earl of Bridgewater, for the uſe of the canal flats. Some of theſe docks communicate, ſo that ſhips can paſs from one to the other, and into the graving docks, without being obliged to go into the river. All the wet docks are likewiſe connected by large tunnels, for the purpoſe of one dock cleanſing or waſhing another. When large ſhips loaded arrive at neap tides they are compelled to remain in the river till the flow of the ſpring tides, as the dock gates have not depth of water ſufficient to admit them. This circumſtance is certainly a great inconvenience, but it is amply compenſated by the capaciouſneſs and excellent arrangement of the docks themſelves.

The cuſtom-houſe is ſituated at the eaſt end of the old dock. It is built of brick, in rather a neat ſtyle. A ſmall flight of ſteps leads to a piazza, over which is the long room, and behind it are extenſive warehouſes. At the ſouth end of the town is St. James's walk, from which the ſpectator has a fine view of the town, the harbour, the river, the ſea, and the Welſh mountains. Behind this lies an excellent quarry, the entrance of which is by a ſubterraneous paſſage, ſupported by arches. Bootle-ſprings, about four miles diſtant from Liverpool, ſupply the town with water, which is conveyed by means of pipes.

The principal manufactures are thoſe of china and earthen ware, the ſeveral branches of the watch making, and extenſive ſalt, iron, and copperas works. It is computed that about 3000 ſhipwrights are conſtantly employed in the different dock-yards of this town. The river, which is here about 1200 yards broad, abounds with ſalmon, cod, flounders, and turbot. Ships of any burden may come up to this town with perfect ſafety, even at the loweſt tides. The accommodations for ſea-bathing have, of late years, received vaſt improvements, and are not perhaps inferior to any in the kingdom.

Liverpool undoubtedly owes all her opulence and grandeur to the ſpirit and enterpriſe of her merchants. She exhibits, to the eye of the ſtateſman and philoſopher, a diſtinguiſhed inſtance of the rapid progreſs of commercial greatneſs. A century ago, a few coaſting veſſels and petty traders formed the whole of her wealth. For the firſt fifty years her advance was comparatively ſlow. After this period, however, the increaſe of trade which ſhe every year acquires, is truly aſtoniſhing. She ſhares a portion of the commerce of almoſt every country in the world. Of late years, Liverpool has conſiderably decreaſed, in common with that of all the other towns in the kingdom. What effect the abolition of the ſlave-trade may ultimately have upon Liverpool, it is not poſſible to prognoſticate. For the preſent, however, the mercantile houſes, formerly engaged in that traffic, muſt undoubtedly ſuffer conſiderable difficulties before they can turn their capital and attention to ſome object more honourable than the purchaſe and ſale of human beings.

Independent of the advantages Liverpool poſſeſſes for foreign commerce, it has communication with all the interior counties by canals. Theſe again, being joined by others at different points, extend themſelves to the Severn, to the Humber, and to the Thames; thus connecting the four principal trading ports in England. To the beneficial effects of theſe canals Liverpool has to attribute much of her preſent greatneſs.

The markets of Liverpool are well ſupplied with every neceſſary of life, and every article of luxury. About 3000 cattle and ſheep are brought into the town weekly. The market days are Wedneſdays and Saturdays. Liverpool ſends two members to parliament. The number of electors amounts to above one thouſand. The corporation conſiſts of a mayor, two bailiffs, and a common-council. The mayor and bailiffs are aſſiſted by a recorder, a town clerk, and other neceſſary officers. The revenues of the town are very great. Enfield's Hiſtory, &c. of Liverpool, folio. A General and Deſcriptive Hiſtory of Liverpool, by Wallace, 8vo. 1797. The Picture of Liverpool, 12mo. 1805. Beauties of England, vol. ix.

Liverpool, a town on the S. ſide of the bay of Fundy, in Queen's county, Nova Scotia, ſettled from New England. Between this town and Annapolis lies a conſiderable lake, called Roſſignol. It is 32 miles N.E. of Shelburne, and 58 N.W. of Halifax, and was formerly called "Port Roſſignole."

LIVERY, properly ſignifies a colour, to which a perſon has ſome particular fancy, and by which he chooſes to diſtinguiſh himſelf, or his retainers, from others.

Liveries are uſually taken from fancy, or continued in families by ſucceſſion. The ancient cavaliers, at their tournaments, diſtinguiſhed themſelves by wearing the liveries of their miſtreſſes: thus people of quality make their domeſtics wear their livery.

Father Meneſtrier, in his Treatiſe of Carouſals, has given a very ample account of the mixtures of colours in liveries. Dion tells us, that Œnamaus was the firſt who invented green and blue colours for the troops which, in the Circus, were to repreſent land and ſea-fights.

The Romiſh church has alſo her ſeveral colours and liveries; white, for confeſſors and virgins, and in times of rejoicing; black, for the dead; red, for the apoſtles and martyrs; blue or violet, for penitents; and green, in times of hope.

Formerly, great men gave liveries to ſeveral, who were not of their family or ſervants, to engage them in their quarrels for that year; but this was prohibited by the ſtatutes 1 Rich. II. 1 Hen. IV. cap. 27. 2 & 7 Hen. IV. 8 Hen. VI. cap. 4. 8 Ed. IV. cap. 2. and no man, of whatever condition, was allowed to give any livery, but to his domeſtic officers, and council learned in the law. However, moſt of the above ſtatutes are repealed by 3 Car. I. cap. 4.

Livery, in *Law*, alſo denotes the delivery of poſſeſſion to thoſe tenants which held of the king in capite, or by knights' ſervice. See Possession.

Livery is alſo uſed for the writ, which lies for an heir to obtain the poſſeſſion or ſeiſin of his lands at the king's hands. By 12 Car. II. cap. 24. all wardſhips, liveries, &c. are taken away. See Court *of Wards*.

Livery *of ſeiſin*, is a delivery of poſſeſſion of land or tenements, or things corporeal, to him who hath right, or probability of right, to them.

Livery of ſeiſin is a ceremony uſed in the common law, on conveyance of lands, tenements, &c. where an eſtate in fee-ſimple, fee-tail, or other freehold, ſhall paſs; and is a teſtimonial of the willing departing of him who makes the livery, from the thing whereof the livery is made, as well as of a willing acceptance by the other party, of all that whereof the firſt has diveſted himſelf. (See Freehold.) On the creation of a freehold remainder, at one and the ſame time with a particular eſtate for years, at the common law livery muſt be made to the particular tenant. (See Estate and Remainder.) But if ſuch a remainder be created afterwards, expectant on a leaſe for years now in being, the livery muſt not be made to the leſſee for years, for then it operates nothing; "Nam quod ſemel meum eſt, amplius meum eſſe non poteſt;" but it muſt be made to the remainder-man himſelf, by conſent of the leſſee for years: for without his conſent no livery of the poſſeſſion can be given (Co. Litt. 48.); partly becauſe ſuch forcible livery would be an ejectment of the tenant from his term, and partly for the reaſons aſſigned for introducing the doctrine of attornments.

Livery of ſeiſin is either in *deed* or in *law*.

The uſual manner of livery of ſeiſin in *deed* is thus performed. If it be in the open field, where is no houſe nor building, and if the eſtate paſs by deed, the feoffor, leſſor, or his attorney, openly reads it, or declares the effect of it; and after that is ſealed, the feoffor takes it in his hand, with a clod of earth, or a twig or bough, which he delivers to the feoffee, in the name of poſſeſſion, or ſeiſin, according to the purport of the deed. If there be a houſe or building on the land, the ceremony is to be done at the door of it, none being then left within; and the ring or latch of the door is delivered to the feoffee, who enters alone, ſhuts the door, and preſently opens it again. If it be a houſe without land or ground, the livery is made, and poſſeſſion given, by delivery of the ring or latch of the door and deed only; and where it is without deed either of lands or tenements, there the party declares by word of mouth, before witneſſes, the eſtate he parts with; and then delivers ſeiſin, or poſſeſſion, as aforeſaid: in which caſe the land paſſes as well as by deed, by virtue of the livery of ſeiſin. Co. Litt. 48. Weſt Symb. 251.

If the conveyance or feoffment be of divers lands, ſcattered in one and the ſame county, livery of ſeiſin of any parcel in the name of the reſt, ſufficeth for all (Litt. § 414.); but if they be in ſeveral counties, there muſt be as many liveries as there are counties. If the lands be out on leaſe, though all lie in the ſame county, there muſt be as many liveries as there are tenants. (Dyer 18.) In all theſe caſes it is prudent to endorſe the livery of ſeiſin on the back of the deed, ſpecifying the manner, time, and place of making it, together with the names of the witneſſes. Livery in *law* is where the ſame is not made *on* the land, but only *in ſight* of it; the feoffor ſaying to the feoffee, "I give you yonder land, enter and take poſſeſſion." However, this livery in law cannot be given or received by attorney, but only by the parties themſelves. Co. Litt. 48. 52.

Anciently, there were a pair of gloves, a ring, knife, an ear of wheat, &c. delivered in ſign of livery and ſeiſin.

LIVERYMEN *of London*, are a number of perſons choſen out of the freemen of each company. (See Company.) Out of this body the common-council, ſheriffs, aldermen, and other officers for the government of the city are elected; and they only have the privilege of giving their votes in common-hall for members of parliament, &c. from which the reſt of the citizens are excluded. If any one of the company refuſe to become a liveryman, he may be fined, and an action of debt will lie for the ſum.

Liverymen, in *Natural Hiſtory*, a name given by authors to a ſort of caterpillars, remarkable for their variety of colours. Theſe are of that claſs of caterpillars which live in communities, and build themſelves neſts to defend them from the injuries of the weather. They may be ranked among the proceſſionary kinds, always following one another with great order in their marches; but what is moſt ſurpriſing, is to ſee them ſtraggle very far from their neſts, and this often, by ſeveral repeated windings and turnings, without loſing their way. Their art, in doing this, deſerves notice, and is the ſame by which Theſeus got out of the labyrinth of Crete. Phil. Tranſ. N° 470. p. 459.

LIVIA Drusilla, in *Biography*, a celebrated Roman lady, daughter of Livius Druſus Calidianus, who joined the party of Brutus and Caſſius, and killed himſelf after the battle of Philippi. She married Tiberius Claudius Nero, by whom ſhe had two ſons, Druſus and the emperor Tiberius. The attachment of her huſband to the cauſe of Antony was the beginning of her greatneſs. Octavianus, afterwards the emperor Auguſtus, ſaw her as ſhe fled from the danger which threatened her huſband, and reſolved to marry her, though ſhe was then pregnant. He accordingly divorced his wife Scribonia, and with the approbation of the augurs he celebrated his nuptials with Livia. She from this moment enjoyed the entire confidence of the emperor, and was in fact the partner of his whole reign, enjoying a large ſhare of his power and imperial dignity. She gained a complete aſcendancy over the mind of Auguſtus by a conſtant obedience to his will: by never expreſſing a deſire to dive into his ſecrets, and by affecting ignorance of his amours. Her children by Druſus were adopted as his own by the complying emperor; and that ſhe might make the ſucceſſion of her ſon Tiberius, Druſus being dead, more eaſy and undiſputed, Livia has been accuſed of ſecretly involving, in one common ruin, the heirs and neareſt relations of Auguſtus. There are facts adduced which ſeem to render the ſuſpicions of her baſeneſs and cruelty wholly without foundation. She has been charged with adminiſtering poiſon to her huſband, which is rendered exceedingly improbable by the account we have of his laſt illneſs, and by the tenderneſs he expreſſed for her in the laſt words he uttered. By his will ſhe was inſtituted coheireſs with Tiberius, adopted as a daughter, and directed to aſſume the name of Julia Auguſta. On his deification ſhe became the prieſteſs of the new god. Tiberius, whoſe elevation had been the object of her policy, diſappointed her expectation of ſharing with him the imperial power. He took pains indeed to ſubject her to various mortifications; and at length there was an open rupture between them. She died in the year 29.

Tiberius neglected her funeral, and would not permit public or private honours to be paid to her memory. Tacitus has drawn her character, ſaying, that "in ſtrictneſs of conduct ſhe was not inferior to the Roman matrons of old, though her demeanour was freer than they would have approved; that ſhe was an imperious mother, a compliant wife, and a match for her huſband in art, and her ſon in diſſimulation."

Livia, in *Ornithology*, a name given by ſome authors to a particular ſpecies of pigeon called *pelæas* by the Greeks. It is very like the common pigeon in ſhape, but is ſomewhat ſmaller, its legs are red, and its beak white, except that it is a little purpliſh about the noſtrils.

It is all over grey, but that the end of its tail-feathers are black, and there is a purpliſh and greeniſh variegation about the ſides and ſhoulders. And its wing-feathers have ſome white variegations, as has alſo the lower part of the neck. It is ſuppoſed by Mr. Ray, and ſome others, to be the ſame with the *ſaſſorolla* of the Italians, or *columba rupicola*. See Columba.

LIVINEIUS, John, in *Biography*, a learned Flemiſh divine, was born at Dendermond about the year 1540. Being intended for the church, he purſued his academical ſtudies at Cologne, entered into holy orders, and was in a ſhort time preſented to a rich benefice at Liege. He was afterwards promoted to a canonry and appointed precentor in the cathedral church of that city. He engaged in the ſuperintendance of the edition of Plantin's Greek bible, and tranſlated into Latin ſome of the works of the Greek fathers, and was about giving to the public all the works of St. Gregory of Nyſſen, when he was cut off by death in 1599. He publiſhed "Emendationes et Notæ in XII. Panegyricos Veteres," and other learned works: and left behind him in MS. tranſlations of the tragedies of Euripides, and of the works of Athenæus. Gen. Biog.

LIVINETHAL, in *Geography*. See Levantine *Valley*.

LIVINGSTON, a county of Kentucky, in America, bounded N. by the Ohio, W. by the Miſſiſſippi, and S. by Teneſſee; 70 miles long and 60 broad. The principal rivers are the Cumberland and Teneſſee. It contains 2787 inhabitants, of whom 444 are ſlaves. Alſo, a large townſhip in Columbia county, New York, extending from the E. bank of Hudſon river to the Maſſachuſetts line, S. of Hudſon adjoining. It contains 7405 inhabitants, of whom 213 are ſlaves.

LIVISTONA, in *Botany*, named by Mr. Brown, in memory of the right honourable Patrick Murray, lord Liviſtone, the friend of ſir Andrew Balfour, who, when the Edinburgh botanic garden was firſt eſtabliſhed, greatly enriched it from his own private collection, where he had above a thouſand ſpecies in cultivation. This nobleman travelled over France in ſearch of plants, where he died of a fever, about the middle of the ſeventeenth century.—Brown Prodr. Nov. Holl. v. 1. 267.—Claſs and order, *Hexandria Monogynia*. Nat. Ord. *Palmæ*.

Eſſ. Ch. Calyx deeply three-cleft. Corolla deeply three-cleft. Filaments ſeparate, dilated at their baſe. Germens three, cohering. Styles three, united into one. Stigma undivided. Berry ſolitary, of one cell. Seed ſolitary; albumen with a ventral cavity; embryo at the back.

A genus of Palms, whoſe leaves are palmate, or ſomewhat pinnate, their ſegments cloven at the extremities. It ſhould ſtand between *Corypha* and *Chamærops*. *Latania chinenſis* of Jacquin's *Fragmenta*, p. 16. t. 11. f. 1, is thought by Mr. Brown to belong to this genus. Two ſpecies of it were found by him in the tropical part of New Holland.

1. L. *inermis*. Segments of the leaves with intermediate threads. Footſtalks without thorns. Stem from 14 to 30 feet high.

2. L. *humilis*. Segments of the leaves with intermediate threads. Footſtalks thorny. Stem from four to ſix feet high.

LIVIUS ANDRONICUS, in *Biography*, is regarded as the moſt ancient of the Roman poets. He was the firſt who attempted to compoſe a drama in verſe, which he himſelf ſung and acted, while a player on the flute accompanied him in uniſon to keep him in tune. He was encored and obliged to repeat his pieces ſo often, that he loſt his voice; and being unable to ſing or declaim any longer, he was allowed to have a ſlave to ſing, while he only acted the part behind him. Hence came the cuſtom of dividing the declamation or melody of the piece, with which the Roman people were extremely delighted. This poet flouriſhed 240 B. C. Livy and Prieſtley.

LIUNG, in *Geography*, a town of Sweden, in Weſt Gothland; eight miles S. of Uddevalla.—Alſo, a town of Sweden, in Eaſt Gothland; eight miles N.N.W. of Linkioping.

LIUNGBY, a town of Sweden, in the province of Skonen; 16 miles E. of Helſingborg.

LIVNI, a town of Ruſſia, in the government of Orel, on the Soſva; 84 miles E. of Orel. N. lat. 52° 58′. E. long. 38° 22′.

LIV OE, a ſmall iſland of Denmark, in Lymfiord gulf; having upon it a village. N. lat. 56° 53′. E. long. 9° 6′.

LIVONIA, the name of an ancient province of Ruſſia, which, including *Eſthonia* (which ſee), lies in N. lat. 58°, and is bounded on the N. by the gulf of Finland, on the E. by Novogorod, on the S. by Poland, and on the W. by the Baltic; being 190 miles from N. to S., and 180 from W. to E., and containing 725,300 inhabitants. This province abounds in lakes, foreſts, marſhes, and rivers; but many diſtricts are exceedingly fertile, yielding great quantities of rye and other grain, flax, hemp, and linſeed, which are exported to Sweden, Germany, and other countries; ſo that Livonia has been called the granary of the north. It has ſeveral good harbours conveniently ſituated for trade. Peipus lake, about 15 leagues long, and ten broad, has a communication with the gulf of Finland by the river Narva. This country, formerly claimed by ſeveral neighbouring princes, frequently changed maſters. Livonia, or Lettland, as it was called, together with Eſthonia, Courland, and Semigallia, being provinces on the Baltic, belonged in the earlieſt times to the Ruſſian ſtate, and had even a ſhare in the founding of it. (See LETTES.) But Livonia had then no ſettled conſtitution, nor was it bound to the parent ſtate by any firm political tie. To the reſt of Europe it remained generally unknown, till in the year 1158 it was diſcovered by ſome merchants of Bremen, in their ſearch of new branches of commerce towards the north. Theſe mariners landed at the mouth of the Duna, opened a trade with the inhabitants, returned thither ſeveral times, and at length proceeded, with the conſent of the natives, along the ſhores of the Duna, or Dwina, many miles up the country. About eighteen years after the diſcovery, an Auguſtine monk, named Meinhard, ſettled in Livonia, proſelyted the Livonians to Chriſtianity, and became their biſhop, upon which many Germans, at various times, were induced to repair thither alſo. The time of the arrival of Meinhard is not preciſely aſcertained. Some pretend that it was in 1170, others in 1186. The ſucceſs of the monk was promoted by the ſervice which he rendered to his own countrymen, in repulſing the Lithuanians, who had made an incurſion upon them. He ſtated to them the neceſſity of conſtructing a ſtrong fortreſs, and he aided them in accompliſhing this object, on condition of their being baptized. But they were reluctant in complying with this condition, and many of them relapſed to Paganiſm. Meinhard was diſappointed in his benevolent efforts, and prevented by force from returning with his clergy to Germany, he died among them, more of grief than of age. After his death, Berthold, abbot of the monaſtery of Lockum, in Hanover, was elected biſhop, and arriving in Livonia, though not without reluctance, in the year 1197, he recommended himſelf by giving them frequent entertainments: but the ardour of their attachment ſoon abated, and he was conſtrained by ill uſage to leave the country. He applied to Gothland and to Lower Saxony for ſuccour; and the pope aſſiſted him by cauſing a cruſade to be preached againſt the heathens of Livonia. In 1198 he returned hither with an army of ſoldiers. The Livonians prepared to fight, took the field to reſiſt the invaders. A truce was concluded, which was ſoon broken on the part of the heathens, by the aſſaſſination of ſeveral Germans. Berthold declared war, and in a bloody battle which enſued, fell by the ſword. The heathens, however, were at length routed, and when their corn-fields were laid waſte by the Chriſtians, they ſued for peace, and flocked in numbers to be baptized. Upon this the Germans returned home; but they were no ſooner embarked, than the Livonians bathed in the Dwina, in order, as they ſaid, to waſh away their baptiſm and Chriſtianity together. They alſo plundered thoſe that remained, and put upwards of 100 to death. The Livonians alſo reſolved, that all prieſts who ſhould be found in the country after Eaſter 1199, ſhould be ſlain. A ſimilar fate alſo awaited the merchants. Theſe ranſomed their lives, but the clergy were forced to fly to Lower Saxony. The monk Meinhard, and the abbot Berthold, were ſucceeded by Albrecht, who, being elected biſhop, arrived in Livonia with twenty-three ſhips. The Livonians became Chriſtians for fear of ſtarving. Albrecht employed valiant men, from whom the biſhopric might expect continual protection; and with this view he gave ample fiefs to ſome courageous nobles. He eſtabliſhed alſo a ſtanding army, and deviſed other methods for eſtabliſhing Chriſtianity in the country. In 1201 he built the city of Riga, and transferred hither the cathedral chapter, where he alſo built a monaſtery. In the mean while the clergy diſperſed themſelves through the country, in order to teach and to baptize. In proceſs of time other means were uſed to accompliſh the converſion of the Livonians.

nians. In the year 1205 Andrew, archbiſhop of Lunden, viſited Riga, and having acquired the reputation of a learned divine by his ſtudies in Italy, France, and England, gave lectures of theology to the clergy of that city; and by his advice the vicar of the biſhop of Riga ſent prieſts among the Livonians, divided the country into diſtinct pariſhes, and cauſed them not merely to be baptiſed, but to be previouſly inſtructed. Churches were alſo erected. From Livonia Chriſtianity was diffuſed, againſt much oppoſition, among the Eſthonians. In the year 1522, the reformation found its way into Liefland, by a preacher, who, having been driven out of Pomerania, fled to Riga. The doctrine of Luther was eagerly embraced; and the Popiſh ritual, afterwards patronized on the part of Poland, had, on the whole, no influence to its detriment. By the tenth article of the treaty of Nyſtadt, the Greek religion is ſecured in the free exerciſe of its rites. In Riga there is a church for the uſe of the Calviniſts, and the Catholics are allowed the exerciſe of their worſhip. In Liefland it may be juſtly ſaid that every man may follow his own perſuaſion in matters of religion without the leaſt moleſtation. Here alſo count Zinzendorf has found many friends to his church inſtitution.

Soon after the converſion of the Livonians, the biſhop, in the year 1201, founded the order of the Sword-brethren, afterwards called Knights-Templars, and granted them the third part of the country with all rights of ſovereignty, for conquering and preſerving Livonia. Theſe knights were all Germans, who proſelyted the natives to Chriſtianity with great ſucceſs, though not without bloodſhed, and made them their vaſſals. They afterwards united themſelves with the Teutonic order in Pruſſia, to whom Valdimar III., king of Denmark, in 1386, ſold Eſthonia for the ſum of 18,000 marks of ſtandard gold. In the year 1521 the Livonian heermeiſter Plettenberg again ſeparated from the Teutonic order, and was admitted by the emperor Charles V. among the princes of the German empire. The attempts made by Czar Ivan Vaſſillievitch II. to reconquer theſe provinces which had been torn from the Ruſſian empire, and the weakneſs of the order, which felt itſelf not in a capacity to reſiſt ſo powerful an enemy, at length, in 1561, effected the complete ſeparation of the Livonian ſtate. Eſthonia put itſelf under the protection of Sweden, Livonia united with Poland, and Courland was a peculiar dukedom under Poliſh ſupremacy, which the laſt heermeiſter Gotthard Kettler held as a fief of that crown. From this era Livonia became the unhappy object of contention, for which Sweden, Ruſſia, and Poland, for an entire century, were continually exhauſting themſelves in bloody wars. Sweden at laſt obtained the dominion, and at the peace of Oliva in 1660 added this province to the poſſeſſion of Eſthonia. Both countries finally, after a war of 20 years, came to the Ruſſians by the treaty of Nyſtadt in 1721; and form at preſent the viceroyalties of Riga and Revel. Theſe two governments are ſuppoſed to contain 24,000 geographical ſquare miles. This country formerly contained a conſiderable number of towns and villages, but by wars and inteſtine commotions, moſt of them were deſtroyed. See Riga and Revel.

The tract of country called Poliſh Livonia, which, under the government of the Teutonic order, formed likewiſe a part of the Livonian ſtate, reverted in the year 1561, with the whole province of that name, to Poland. At the peace of Oliva, by which Livonia came under the ſovereignty of Sweden, this ſole diſtrict however remained to the Poliſh ſtate, retaining from that time its name in contradiſtinction to Swediſh Livonia. On the partition in 1773, this country, which had hitherto conſtituted its particular voivodeſhip, was annexed to Ruſſia, and now comprehends the two circles of Dunaburg and Reſitza, in the viceroyalty of Polotſk. Tooke's View of the Ruſſian Empire, vol. i.

LIVONICA Terra, in the *Materia Medica*, a kind of fine bole uſed in the ſhops of Germany and Italy, of which there are two ſpecies, the yellow and the red. (See Bole.) The diſtinguiſhing characters of which are theſe.

The yellow Livonian earth is a pure and perfectly fine bole, of a ſhattery friable texture, conſiderably heavy, and of a dull duſky yellow, which has uſually ſome faint bluſh of redneſs in it. It is of a ſmooth ſurface, and does not ſtain the hands; it adheres firmly to the tongue, and melts freely in the mouth, leaving no grittineſs between the teeth, and ferments not at all with acid menſtrua. In a moderate fire it acquires ſome additional hardneſs, and a darker colour. It has been eſteemed a ſudorific and an aſtringent.

The red Livonian earth is an impure bole of a looſe texture, and a dull red. It is of a ſmooth ſurface, breaks eaſily between the fingers, and ſlightly ſtains the hands. It melts freely in the mouth, has a very ſtrong aſtringent taſte, but leaves a grittineſs between the teeth, and is alkaline. It acquires a conſiderable hardneſs in the fire, and becomes of a paler colour with a ſtrong caſt of yellowiſh-brown.

Theſe earths are both dug out of the ſame pit, in the place from whence they have their name, and in ſome other parts of the world. They are generally brought to us made up in little cakes, and ſealed with the impreſſion of a church, and an eſcutcheon with two croſs keys, and recommended in diarrhœas, dyſenteries, &c.

LIVORNINA, an old coin of Leghorn, equal in value to *4s.* $5\frac{1}{2}$*d.* ſterling.

LIVORNO, in *Geography*. See Leghorn.

LIUR, a town of Sweden, in Weſt Gothland; 33 miles N.E. of Gotheborg.

LIVRE, a French money of account, in the old ſyſtem, conſiſting of twenty ſols; each ſol containing twelve deniers and four liards.

The origin of the word is derived hence, that anciently the Roman libra, or pound, was the ſtandard by which the French money was regulated; twenty ſols being made equal to the libra. By degrees the libra became a term of account; ſo that any coin juſt worth twenty ſols was a livre, or libra; and ſince the time of Charlemagne, all contracts have been made on the foot of this imaginary coin; though the ſols have frequently changed their weight and alloy.

The livre is of two kinds, *Tournois* and *Pariſis*.

Livre *Tournois*, as above, contains twenty ſols Tournois, and each ſol twelve deniers Tournois.

Livre *Pariſis*, is twenty ſols Pariſis, each ſol Pariſis worth twelve deniers Pariſis, or fifteen deniers Tournois; ſo that a livre Pariſis is equivalent to twenty-five ſols Tournois; the word Pariſis being uſed in oppoſition to Tournois, on account of the rate of money, which was one-fourth higher at Paris than at Tours.

The franc and livre were formerly ſynonimous; but in the coinage of 1795, the franc was made too heavy, and its value was accordingly raiſed $1\frac{1}{4}$ *per cent.*: thus, 80 francs = 81 livres. In 1796, it was ordered that the piece of five francs ſhould paſs for five livres one ſol three deniers Tournois, from which the proportion of the franc to the livre of 100 to $101\frac{1}{4}$ is determined; but the accuracy of this proportion has been queſtioned by writers of the firſt authority, who have calculated it to be as 100 to $101\frac{1}{2}$. See Coins, Exchange, and Money.

For an account of the coin and money of account, both under the old and new ſyſtem of 1795, ſee Money.

There have ſince been pieces of gold ſtruck of twenty ſols value; and under Henry III. in 1575, pieces of ſilver of like value: both the one and the other were called *francs;* and thus the imaginary coin became real. It appears that the Romans had alſo a kind of money, which they called *libra*, or *libella;* which was the tenth part of their denarius; ſo called, becauſe equivalent to an *as*, which at firſt weighed a *libra* or pound of copper. Scaliger adds, that they uſed libra as a term of account, not as a coin: "Libra erat collectio nummorum, non nummus."

Livre *Ouvert*, *Fr.* in *Muſic.* To ſing or play *à livre ouvert*, is equivalent to playing or ſinging *at ſight*, at the opening of a book. All muſicians pique themſelves on being able to perform a muſical compoſition at ſight, without previous ſtudy or practice; but Rouſſeau very juſtly obſerves, that there are few who, in this kind of execution, ſeize the true ſpirit of the author, and who, though they hit the right notes, do not miſtake the expreſſion.

LIUSDAL, in *Geography*, a town of Sweden, in the province of Helſingland; 32 miles W.N.W. of Hudwickſwal.

LIUSNABRUCK, a town of Sweden, in the province of Helſingland; 5 miles S. of Soderhamn.

LIUSNAN, a river of Sweden, which riſes in the mountains of Harjedalen, and diſcharges itſelf into the gulf of Bothnia; 8 miles S. of Soderhamn. N. lat. 61° 15′. E. long. 17°.

LIUSTARNO, an iſland of Sweden, in the Baltic. N. lat. 59° 30′. E. long. 18° 30′.

LIUSTORP, a town of Sweden, in Medelpadia; 15 miles N. of Sundſwall.

LIUSUDBORG, a town of Sweden, in Nericia; 40 miles N. of Orebro.

LIUTPRAND, in *Biography*, an hiſtorical writer of the tenth century, ſaid by ſome authors to have been a Spaniard, by others an Italian. His father was in the confidence of Hugo, king of Italy; and the ſon, while very young, was placed in the court of Berenger II., who obtained the kingdom by diſpoſſeſſing Hugo, and was ſent by him ambaſſador to the Greek emperor, Conſtantine Porphyrogenitus, on account of his intimate acquaintance with the Greek language. Loſing the favour of his own maſter, he was obliged, in 958, to go an exile to Germany, where he compoſed the hiſtory of his own times, which is extant. The fall of Berenger, who was ſtript of his dominions, in 961, by Otho I., reſtored Liutprand to his country; and he was ſoon after conſecrated biſhop of Cremona. In quality of this office, he attended an aſſembly of biſhops at Rome in 963, in oppoſition to the pope, John XII. He was again ſent ambaſſador to the court of Conſtantinople, in the name of Otho, to ſolicit the daughter of the Greek emperor for the ſon of Otho: he was unſucceſsful; and being much hurt at the reception he met with, he ſatirized the pride and ignorance of the court in an account of his embaſſy, annexed to his hiſtory. The time of his death has not been aſcertained; but his ſignature occurs in a ſynod held at Ravenna in 970, under the title of Liuzio, biſhop of Cremona. This hiſtorical work of Liutprand conſiſts of ſix books, of which ſome of the latter chapters are ſuppoſed to have been written by another hand. It has paſſed through ſeveral editions: the laſt is that of Muratori, in his "Scriptores Rerum Ital."

LIUTZIN, in *Geography*, a town of Ruſſia, in the government of Polotſk; 60 miles N.N.W. of Polotſk. N. lat. 56° 25′. E. long. 27° 34′.

LIVY, Titus Livius, in *Biography*, an eminent Roman hiſtorian, is ſuppoſed to have been a native of Padua. He came to Rome in the reign of Auguſtus, and was admitted to the familiarity of ſeveral perſons of rank, and of the emperor himſelf. He made himſelf known by ſome philoſophical dialogues; but his literary reputation was principally built upon his Roman hiſtory, which enjoys a perpetual celebrity: no work of the kind was ever received with greater applauſe. Few particulars of his life are known; yet his fame was ſo univerſally ſpread, even in his life time, that a perſon traverſed Spain, Gaul, and Italy, merely to ſee the man whoſe writings had given him ſuch pleaſure and ſatisfaction in the peruſal. Livy died at Padua in his 67th year, and, according to ſome, on that ſame day Rome was alſo deprived of another of its brighteſt ornaments by the death of Ovid. Livy wrote a letter, addreſſed to his ſon, on the merit of authors, which is greatly commended by Quintilian, who expatiates with great warmth and ardour on the judgment and candour of the writer. His Roman hiſtory was comprehended in 140 books, of which only 35 are extant. It began with the foundation of Rome, and was continued till the death of Druſus in Germany. The merit of this hiſtory is well known, and the high rank which Livy holds among hiſtorians will never be diſputed. His ſtyle is clear and intelligible, laboured without affectation, diffuſive without tedioufneſs, and argumentative without pedantry. His deſcriptions are ſingularly lively and pictureſque; and there are few ſpecimens of oratory ſuperior to that of many of the ſpeeches with which his narratives are copiouſly interſperſed. Of the editions of Livy, thoſe moſt eſteemed are that of Gronovius cum Notis variorum, 3 vols. 8vo. Lugd. B. 1679; of Le Clerc, Amſt. 10 vols.; of Crevier, 6 vols.; of Drakenborch, Amſt. 7 vols. Livy's works have been divided by ſome moderns into 14 decades, each conſiſting of 10 books. The firſt decade comprehends the hiſtory of 460 years. The ſecond decade is loſt, and the third includes the hiſtory of the ſecond Punic war, or a ſpace of about 18 years. In the fourth decade, Livy treats of the wars with Macedonia and Antiochus, which contain 23 years. For the firſt five books of the fifth decade we are indebted to the reſearches of the moderns. They were found at Worms, in the year 1451. Theſe are the remains of Livy's hiſtory. Freinſhemius, with great induſtry and attention, has made an epitome of the Roman hiſtory, which is now incorporated with the remaining books of Livy.

LIW, in *Geography*, a town of the duchy of Warſaw; 40 miles E. of Warſaw.

LIXEME, a town of Pruſſia, in Oberland; 5 miles S.S.W. of Saalfeldt.

LIXIVIOUS, Lixivial, or *Lixiviate*, in *Chemiſtry*, is underſtood of ſalts extracted from burnt vegetables by lotion.

Lixivious ſalts are the fixed ſalts of plants, &c. extracted by calcining the plants, or reducing them to aſhes, and afterwards making a lixivium of thoſe aſhes with water.

Mr. Boyle obſerves, that the difference between lixivious and urinous ſalts conſiſts in this, that the former change the diſſolution of ſublimate in common water into a yellow colour, which the latter do not. See Alkali and Salt.

LIXIVIUM, Ley, or *Lees*, a liquor made by the infuſion of wood-aſhes; or, it denotes any alkaline ſolution, made by lixiviating pearl, or wood, or other aſhes.

What is left after the evaporation of ſuch a liquor is called a lixivious ſalt; ſuch as all thoſe are which are made by incineration.

Lixiviums are of uſe, not only in medicine, but alſo in bleaching, ſugar-works, &c. See Bleaching, Sugar, and Pot-ashes.

Lixivium *Martis*, in *Medicine*, a form of medicine introduced into practice in the London Diſpenſatory. The manner of preparing it is to let the matter remaining in the retort after the ſubliming of the flores martis, in a damp place, where by means of the moiſture of the air it will run into a liquor. See Flores *Martiales*, and Iron.

Lixivium *Saponarium*, *Soap-lees*, *Aqua kali puri*, P. L. 1787; *Liquor potaſſæ*, P. L. 1809; a liquor that has been much uſed in medicine in caſes of the ſtone (ſee Lithontriptic); and when intended for this uſe, it is to be made ſomething leſs ſtrong than for the ſoap-boilers' uſe, and ſhould be prepared in the following manner. Take Ruſſia pot-aſh, and quick-lime, of each an equal quantity; though pure alkaline ſalt requires commonly about twice its weight of quick-lime to render it completely cauſtic, which is known by the ley making no effervescence with acids: throw water on them in ſmall quantities till the lime is ſlaked; then throw on more water, and ſtir the whole together, ſuffering it to ſtand for a day or two, that the ſalt of the aſhes may be diſſolved; after ſome time pour the liquor, filtered through paper, if needful, into another veſſel. A true ſtandard wine-pint of this liquor meaſured with the greateſt exactneſs, ought to weigh juſt ſixteen ounces troy. If it be found on trial to be heavier than this, for every drachm it exceeds that weight, an ounce and a half of water is to be added to each pint: but if it be lighter than this, it muſt be either boiled to this ſtandard, or elſe poured upon freſh lime and aſhes.

The makers of ſoft ſoap with us prepare their lees ſo much ſtronger than this, that to be reduced to this ſtandard, it requires to be diluted with an equal quantity of fair water.

Quick-lime has the property of increaſing conſiderably the cauſticity of all fixed alkalies, by abſorbing their fixable air or gas. See Lime.

This cauſtic ley, evaporated to dryneſs, furniſhes an alkaline ſalt exceedingly acrid, which being melted in a crucible becomes what is called common *cauſtic;* becauſe when it is applied to the ſkin, it makes an eſchar, pierces it, and leaves an ulcer, the ſuppuration of which, when continued, is called an *iſſue*. Cauſtic alkali has not only much greater diſſolving power, but it is alſo much more deliqueſcent, and attracts much more powerfully the moiſture of the air, than ordinary alkali. This inconvenience is avoided by boiling down the ſoap ley only to one-fourth part, and then, while the liquor continues boiling, ſprinkling in, by little and little, ſo much powdered quick-lime as will abſorb it, ſo as to form a kind of paſte.

The *liquor potaſſæ*, or ſolution of potaſs, of the laſt London Pharmacopeia, is prepared by diſſolving a pound of ſubcarbonate of potaſs, *i. e.* the kali præparatum, P. L. 1787, or ſal abſinthii, ſal tartari of P. L. 1745, in two pints of boiling diſtilled water; then adding three quarts of the water to a pound of lime newly prepared: mix the liquors while they are hot, ſtir them together, then ſet by the mixture in a covered veſſel, and, after it has cooled, ſtrain the ſolution through a cotton bag. If any diluted acid, dropped into the ſolution, occaſion the extrication of bubbles of gas, more lime muſt be added, and the mixture ſtrained again. This ſolution is more denſe than water, and, when ſhaken, appears like oil.

Lixivium *Tartari*, the name given in the London Diſpenſatory of 1745 to the liquor called by moſt authors, as in P. L. 1720, *oil of tartar per deliquium;* in P. L. 1787, *aqua kali præparati;* and in P. L. 1809, *liquor potaſſæ ſubcarbonatis*. This is made of tartar, which is to be calcined to a whiteneſs, and then ſet in a damp place, where it will liquify by the moiſture of the air. The liquor thus procured is more pure than if the calcined tartar were diſſolved directly in water.

In the laſt P. L. it is directed to be prepared by diſſolving a pound of ſubcarbonate of potaſs in twelve fluid ounces of diſtilled water, and then ſtraining the ſolution through paper. This ſolution will, in the ordinary ſtate of the ſubcarbonate, amount to nearly 18 ounces in bulk.

LIXURI, in *Geography*, a town of the iſland of Cephalonia; 12 miles W. of Cephalonia.

LIZARD, in *Aſtronomy*. See Lacerta.

Lizard, in *Natural Hiſtory*. Having, in various parts of our work, referred to the article Lacerta, of which, in its proper place, we were diſappointed, we ſhall now, it being the firſt opportunity afforded us after the omiſſion, give an account of the whole genus, including a great variety of animals, which, although they poſſeſs many characters in common, yet exhibit conſiderable differences in their economy and habits, and alſo in their ſtructure and external form.

For the anatomical deſcription of this genus, we refer to the article Reptiles.

The genus lacerta has by ſome naturaliſts been regarded as a diſtinct order, and as ſuch has been divided into ſeveral genera; but following the Linnæan arrangement, we ſhall conſider the ſubject under the diviſions or ſections into which Linnæus ſeparated the genus.

Dr. Shaw has thus enumerated them:

1. Crocodiles, furniſhed with ſtrong ſcales.
2. Guanas, and other lizards, either with ſerrated or carinated backs and tails.
3. Cordyles, with denticulated, and ſometimes ſpiny ſcales, either on the body or tail, or both.
4. Lizards proper, ſmooth, and the greater number furniſhed with broad ſquare ſcales, or plates on the abdomen.
5. Chameleons, with granulated ſkin, large head, long miſſile tongue, and cylindric tail.
6. Geckos, with granulated or tuberculated ſkin, and lobated feet, with the toes lamellated beneath.
7. Scinks, with ſmooth, fiſh-like ſcales.
8. Salamanders, newts, or efts, with ſoft ſkins, ſome of which are water-lizards.
9. Snake-lizards, with extremely long bodies, very ſhort legs, and minute feet.

This is an active tribe, and, with the exception of the aquatic animals, feeds on inſects: the crocodiles have both jaws moveable, and the largeſt mouth of all animals: their body is covered with calloſities: the chameleons have a prehenſile tail; ſit on trees; walk ſlowly and irregularly; have no teeth; eyes large, fixed in a wrinkled ſocket; tongue very long, worm-ſhaped, with which they draw in flies; head angular, covered with very thin lucid tubercles or ſcales.

The foregoing diviſions, it is admitted, neither are nor can be perfectly preciſe, ſince ſpecies occur which may, with nearly equal propriety, be referred to either of the neighbouring ſections: on this account naturaliſts have not been agreed as to the exact number of ſpecies in each ſection, nor even as to the number of ſections themſelves. Dr. Shaw, as we have ſeen above, has ſeparated the genus into nine ſections; he has been followed by many other reſpectable writers, but in the laſt edition of Gmelin, as given by Dr. Turton, the genus is divided into eleven ſections, which ſhall be given in their order.

Section A. Tail two-edged, divided into ſegments; tongue very ſhort.

Species.

Crocodilus, or Crocodile of the Nile; has a mailed head; nape carinate, tail above with two lateral creſts.

This animal, as its name imports, is chiefly found in the river Nile, or on it's banks. It ſometimes arrives at a very great ſize: the common ſize of a full grown crocodile is from 18 to 25 feet long, though ſome have been ſeen that meaſure full forty feet in length. The colour of the upper part is a blackiſh-brown, but beneath it is of a yellowiſh-white. The upper parts of the legs and ſides are varied with deep yellow, and in ſome parts tinged with green. The opening of the mouth is of vaſt extent, and both jaws are furniſhed with numerous ſharp-pointed teeth; thoſe in the middle part of the jaw being largeſt, and reſembling the canine teeth of viviparous animals. The external openings of the ears are placed on the top of the head, above the eyes, and the eyes themſelves are furniſhed with a nictitating membrane, ſimilar to that of birds. The legs are ſhort, ſtrong, and muſcular. The tail is long, compreſſed on the ſides, and furniſhed above with an upright proceſs, formed by the gradual approach of two elevated creſts, which proceed from the lower part of the back. The upper part of the body of the crocodile is covered with a ſtrong armour, which in its ſtructure exhibits the appearance of the moſt curious carved work, and is indeed a fine piece of mechaniſm. The crocodile depoſits its eggs in the ſand or mud on the banks of the rivers which it inhabits, and as ſoon as the young are hatched, they proceed to the water. The crocodile is a native of Aſia and Africa, but it ſeems more common in the latter than in the former country. It inhabits only large rivers, and lives chiefly on fiſh, but being extremely voracious, it ſeizes any other animal that comes within its reach. The crocodile has long been regarded as one of the moſt formidable animals of the countries in which it is found, but ſome late travellers ſeem to have entertained a leſs formidable opinion of them. M. Denon, ſpeaking of the French army in Egypt, ſays that the ſoldiers and himſelf bathed daily in the Nile, and yet they were never once attacked by them, nor did they ever meet with a ſingle crocodile at a diſtance from the water. Hence he inferred that they find in the river a ſufficient quantity of eaſily procurable food, which they digeſt ſlowly, being, like the lizard and ſerpent, cold blooded, and of an inactive ſtomach. "Beſides," ſays the traveller, "having in the Egyptian part of the Nile no enemies but each other and man, they would be truly formidable, if, covered as they are with an almoſt impenetrable defenſive armour, they were ſkilful and alert in making uſe of thoſe means which nature has given them for attack." He farther adds, that they ſaw three crocodiles, one of which was nearly twenty-five feet in length; they were all aſleep, ſo that they could approach them within about twenty yards, and had an opportunity of diſtinguiſhing them very accurately. He ſays, that in that poſition they reſembled diſmounted cannon: he fired on one, the ball ſtruck him and rebounded from his ſcales. He made a leap of ten feet, and dived into the river.

In the large rivers of Africa, and in certain parts of thoſe rivers, they may be ſeen in vaſt ſhoals ſwimming together, where they exhibit the appearance of floating timber. A variety of the common crocodile has been found in the river Senegal, it has a longer ſnout, and is almoſt entirely black. It is very ſwift, voracious, and of amazing ſtrength; it roars hideouſly; devours every thing that comes in its way; ſwallows ſtones to prevent hunger, and cannot be killed by a muſket ball unleſs ſtruck on the belly: it ſeldom moves but in a ſtraight line, and may accordingly be avoided: the female lays her eggs in the ſand, which are not much larger than thoſe of a gooſe.

Gangetica, or Gangetic crocodile. This animal has long, roundiſh, or ſub-cylindric jaws; its tail on the upper ſide has two creſts running into one.

This ſpecies is found in the Ganges, where it is nearly equal in ſize to the common crocodile. In this the ſtructure of the ſnout is very remarkable, it being nearly three times as long as the head. The eyes are extremely prominent, and it is ſaid they are ſo conſtructed, that they may be raiſed above the water, when the reſt of the body is under the ſurface, by which the animal is enabled to ſee its prey either on the ſurface of the water, or on the banks of rivers. In the general form and colour of the body and limbs, this ſpecies reſembles the common crocodile. In the Britiſh Muſæum is a ſpecimen of this creature, meaſuring eighteen feet in length.

Alligator. The head of this animal is flat, imbricate; nape naked; tail above with two rough lateral lines.

It inhabits the middle parts of America, is leſs than a crocodile, but reſembles it in habits and voracity. The largeſt in ſize, and the greateſt numbers of alligators, inhabit the torrid zone, nevertheleſs the continent ten degrees more north abounds with them, particularly as far as the river Neus in North Carolina. In the latitude 33°, which anſwers to the northernmoſt parts of Africa, where they are likewiſe found, they frequent not only ſalt rivers near the ſea, but ſtreams of freſh water in the upper parts of the country, and in lakes of ſalt and freſh waters, on the banks of which they lie lurking among the reeds to ſurpriſe cattle and other animals. They are found in Jamaica, and many parts of the continent, full 20 feet in length. But we are told they cannot be more formidable in their aſpect than terrible in their nature, ſparing neither man nor beaſt which come within their reach, pulling them under water and drowning them, in order that they may with greater facility, and without a ſtruggle or reſiſtance, devour them. They ſubſiſt chiefly on fiſh, but as Providence, for the preſervation, or to prevent the extinction of defenceleſs creatures, has in many inſtances reſtrained the devouring appetites of voracious animals, by ſome certain impediments; ſo this deſtructive monſter can proceed only in a ſtraight forward direction, and is conſequently diſabled from turning with that agility requiſite to catch his prey by purſuit; therefore alligators do it by ſurpriſe in the water, as well as by land: they have the power of deceiving and decoying their prey, by a ſagacity peculiar to themſelves, as well as by the outer form and colour of their body, which on land reſembles a log or tree, and in the water lies floating on the ſurface, and has the like appearance, by which, and their ſilent artifice, fiſh, fowl, and turtle, are lured into their graſp, and ſuddenly catched and devoured. Carnivorous animals get their food with more difficulty, and leſs certainty than thoſe which ſubſiſt on vegetable ſubſtances, and are frequently obliged to faſt long, which a ſlow digeſtion enables them to endure. Reptiles particularly, by ſwallowing whole what they eat, can live long without food. Alligators ſwallow ſtones and wood, to diſtend the ſtomach and prevent its contraction by emptineſs. They lay a great number of eggs at one time on ſandy banks of rivers and lakes, which are hatched by the heat of the ſun, without any care of the parent. The young, as ſoon as they are diſengaged from the ſhell, run to the water by a natural inſtinct and ſhift for themſelves, and while young they ſerve as a prey not only to ravenous fiſh of other tribes, but to their own ſpecies. In South Carolina they are numerous, but ſmaller than thoſe towards the equator, but they attack men and cattle, and are great devourers of the race of ſwine. In Carolina they lie torpid during the winter in caverns and hollows in the banks of the rivers, and at their coming out in the ſpring make a hideous bellowing noiſe. According to Cateſby, in his hiſtory of Carolina, ſome parts of alligators are reckoned very delicious food by the Indians. They depoſit their eggs at two or three different periods, and more than twenty of them at each laying. They have been obſerved to raiſe a ſmall hillock near the banks of the river, and after hollowing it out in the middle, to collect a quantity of leaves and other vegetable matters, in which they depoſit their eggs. Both the alligator and crocodile are ſuppoſed to be long lived animals. It has been thought the crocodile, or ſome of the ſpecies, was the leviathan mentioned in the book of Job, chiefly, perhaps, becauſe the deſcription of this monſter does not ſufficiently correſpond with the general ſtructure of the whale; nevertheleſs, the leviathan there mentioned will correſpond full as little with any of the ſpecies of the crocodile now known as with the whale, and it is more probable, that, like the mammoth, the leviathan of the ſcriptures is not now to be found on the face of the earth.

Section B.—The animals of this ſection have the body covered with carinate ſcales.

Species.

CAUDIVERBERA, or flat-tailed lizard, is found in Peru and Chili, and is about twelve or fifteen inches long. The tail is depreſſed, flat, wing-cleft; feet palmate. The body is inclining to blue; ſcales very minute; head convex, oblong; eyes very large, yellow; noſtrils wide, with a fleſhy edge; mouth large, teeth minute, hooked in a double ſeries; tongue thick, broad, red; chin with a dilatable pouch; creſt running down the back from the front to the tip of the tail, undulate at the edge; feet five-toed, with a cartilage inſtead of nails.

DRACÆNA, or large long-tailed lizard, with a ſmooth body, and tail denticulated along the upper part. The body is of a deep cheſnut-colour; the ſcales are very minute; the legs teſſellate, with ſaffron and white. It inhabits America, and has been named the large American cordylus, and has ſometimes been confounded with the caudiverbera juſt noticed.

It is a native of ſeveral parts of South America, and of ſome of the Indian iſlands, and is regarded, in ſome countries in which it is found, as a great delicacy. The head is ſmall, and rather elegantly formed, the ſnout tapering in ſuch a manner as to bear a reſemblance to that of an Italian grey-hound; the teeth are ſmall and numerous, and the tongue forked; the proportions of the neck and limbs are elegant, though ſtrong; and the body is moderately thick; the tail is of great length. The whole animal is ſmooth, or deſtitute of prominences on the ſkin, which is covered with ſmall, ovate, and, in ſome parts, ſlightly ſubquadrate ſcales, largeſt on the outſide of the limbs, the back, and the abdomen; along the upper edge of the tail runs a continued ſeries of ſhort triangular denticulations; the feet are moderately ſtrong, and the toes are armed with ſharp crooked claws.

Dr. Shaw mentions a variety, of which there was a ſpecimen in the Leverian Muſæum, which differs in being of a pale brown colour, variegated on the body and tail by ſeveral deep-brown tranſverſe bands, among which, as alſo on the abdomen and limbs, are interſperſed many ſmaller variegations, and ſpots of a ſimilar colour.

BIMACULATA, or Pennſylvanian lizard, has a tail carinate, toothed, twice as long as the body, all the toes, of which there are five on each foot, are lobate. The colour of its body is greeniſh-blue, moſtly ſpotted with black; the ſhoulders with two large ſpots. It is found in the woods of St. Euſtatius and Pennſylvania, and lives in holes, gutters, and hollow trees; makes a hiſſing noiſe, and depoſits its eggs in the earth.

MONITOR, or monitor lizard, is one of the largeſt of the lizard tribe; it meaſures ſometimes from four to five feet. Its colour is black; tail very long, compreſſed, carinated; body marked with tranſverſe rows of white, ocellated.

This is a very beautiful animal. The head is ſmall; the ſnout gradually tapers; the limbs are ſlender; and the tail, which is laterally compreſſed, gradually decreaſes towards the extremity. As a whole, the form is ſlender and elegant; though the colours are ſimple, they are ſo diſpoſed as to produce an agreeable effect. It is a native of South America, inhabiting woody and marſhy places. If credit may be given to reports of authors, who pretend to have ſtudied its habits and characters with much accuracy, its diſpoſition is as gentle as its appearance is beautiful. It has even gained the title of monitor ſalvaguarda, &c. from its pretended attachment to the human race: it has been confidently affirmed, that it warns mankind of the approach of the alligator by a loud and ſhrill whiſtle.

There is a variety of this animal mentioned by White, in his "Journal of a Voyage to New South Wales;" but in Gmelin's edition of the "Syſtema Naturæ," it is given as a diſtinct ſpecies, under the name of

VARIA, or variegated lizard. Though there is a great reſemblance between this and the monitor; yet there are certain points of difference in its colour, and variegations that will juſtify its introduction as a ſeparate ſpecies. The tail is long, carinate; body blackiſh, tranſverſely variegated with yellow ſpots and marks.

It is found in New Holland. The markings on the body, inſtead of the general ocellated pattern of the preceding, conſiſt of rounded, or ſlightly ſubangular ſpots and variegations: the limbs, as in the monitor lizard, are marked with numerous bands and ſpots, and the tail is banded; the claws are very large and ſtrong.

BICARINATA, or bicarinated lizard, has a tail of moderate length; four rows of ſtrong carinated ſcales on the back. The head is ſmall; the mouth very wide in proportion, and the ſnout ſomewhat ſharp. It is of a reddiſh-brown colour, tinged in ſome parts with various ſhades of green.

In its general habit, this ſpecies bears a reſemblance to a ſmall crocodile, on account of the hard tuberculated and carinated ſcales, on the upper parts of the body, two rows of which are more prominent than the reſt, and extend from the upper part of the back to the tail, where they coaleſce and form a ſerrated creſt to the extremity. It is a native of South America, where it is ſometimes uſed as food, and its eggs are highly eſteemed. Its haunts are woody and marſhy regions: it is fond of water; and one kept ſome time by M. de la Borde, often continued in it for ſeveral hours together, hiding itſelf when diſturbed or affrighted, but it ſeemed delighted in coming out and baſking in the direct and ſtrong rays of the ſun.

A lizard, known under the name of *ignaruca*, a native of Brazil, is regarded as a variety of the ſpecies juſt deſcribed, differing only in colour, which is darker, and the claws, which are ſhorter, but, like it, there is ſome reſemblance between it and the crocodile: it readily climbs trees.

CORDYLUS, or Cordyle lizard, has a ſmooth body, ſhort tail that is verticillated with denticulated ſcales. This ſpecies is ſometimes blue, and ſometimes of a livid-brown, and the total length is not above ten or eleven inches. The ſcales which cover the body are of an oblong form, and the tail is verticillated with rows of large ſcales.

Section C. Back and tail, or the whole body, covered with denticulate or ſharp-pointed ſcales.

Species.

PELLUMA, or Pelluma lizard, has a long tail, and verticillated with rhomboidal ſcales. It is about two feet in its total length, and is diſtinguiſhed on the upper parts of its body by a beautiful variety of green, yellow, blue, and black colours. The under parts of the body are of a gloſſy yellowiſh-green: it is a native of Chili, and lives under ground; the inhabitants of that country make its ſkin into pouches. Its feet are five-toed, and its claws very ſtrong.

STELLIO, or rough lizard, has a verticillated tail, with denticulated ſcales: the body and head are muricated.

This ſpecies, as its Engliſh name implies, is remarkable for the unuſually rough appearance of its whole upper ſurface; both body, limbs, and tail being covered with pointed ſcales, projecting here and there to a conſiderable diſtance beyond the ſurface. The general colour of the animal is a pale blueiſh-brown, with a few deeper and lighter tranſverſe variegations. It is not above eight or nine inches in length. It is a native of many parts of Africa. Dr. Shaw, in ſpeaking of this ſpecies, ſays, "it may be obſerved that the lizard, which was probably termed *Stellio* by the ancients, from its being marked with ſpots reſembling ſtars, ſeems at preſent unknown. It is, however, obſervable, that in one of Seba's plates a ſpecies occurs, which is actually marked with well-defined or regular ſtar-ſhaped ſpots." Some naturaliſts conſider the lizards called geckos as the true *ſtelliones*.

MAURITANICA, or Mooriſh lizard, is characterized by a ſubverticillate tail, muricate, ſhort, ſmooth at the tip, body above muricate, toes unarmed, lamellate beneath.

This is one variety: the ſecond is diſtinguiſhed by a verticillate tail; and the third by having a prickly body. It is found in Mauritania, and in ſome parts of India. The body is lurid, the upper part has protuberances, the lower is ſmooth; ſcales are very minute; tail ſhorter than the body, from the baſe to the middle rough, with ſix rows of ſpines, thence to the tip ſmooth.

AZUREA, Azure lizard. Tail verticillate, ſhort with mucronate ſcales.

This is the *elegantiſſima* of Seba. The colour, in its natural ſtate, ſeems to be an elegant pale blue, faſciated on the body and tail with ſeveral tranſverſe, and alternate bands either of black or very deep blue; but this is ſaid to be moſt conſpicuous in the ſmaller ſpecimens or varieties. It is ſometimes only a few inches long. The larger variety has a deep cheſnut band on the ſhoulders. The ſmaller variety is a native of ſome parts of Africa; the larger of South America.

ANGULATA, or Angulated lizard, has a long and hexagonal tail, and is furniſhed with carinated and mucronated ſcales. This is a ſmall ſpecies, having a tail longer than the body. The colour is of a duſky brown. Beneath the throat there are two rounded ſcales. The tail is longer than the body, and ſtrongly marked with longitudinal ridges. It is a native of America.

ORBICULARIS, or Orbicular lizard, has a brown body; the tail is ſhort, ſcales muricated. Both body and tail are round. The colour is of a duſky brown, variegated with different ſhades; the body is large, and in ſome reſpects it reſembles a toad. It is a rare ſpecies, and is a native of South America, particularly in New Spain.

BASILISCUS; Baſiliſk lizard. Tail round; dorſal fin radiate; hind-head creſted. The baſiliſk is about eighteen inches long, of a pale aſh brown colour, with ſome darker variegations about the upper part of the body. In the young animal, the dorſal or caudal proceſs, and the pointed occipital creſt, are leſs diſtinct.

The baſiliſk is chiefly a native of South America. It reſides principally among trees, and its food is inſects. It is active, and by means of its dorſal creſt or fin, it is enabled to ſpring from tree to tree. It can ſwim with great eaſe. It has a very formidable appearance, but is quite harmleſs. In the poetical deſcriptions of the ancients, it was conſidered to be the moſt malignant of all poiſonous animals, even its look was regarded as fatal. The terrific glance of the baſiliſk in the African deſerts, according to Lucan, obliged the reſt of the poiſonous tribe to keep at a diſtance.

PRINCIPALIS; Smooth-creſted lizard. The tail of the ſpecies is ſubcarinate; creſt on the throat very entire, back ſmooth. It is of a ſlender form, and ſmall, rarely exceeding eight or nine inches in length, including both body and tail. The colour is blue, the head ſmall, and the ſnout taper. It is a native of South America.

PLATURA; Broad-mailed lizard. Colour grey-brown, paler beneath; body rough; tail depreſſed, lanceolated, and ſpiny on the margin. This ſpecies is from four to ſix inches long; it is diſtinguiſhed by the ſingular form of its tail. The feet are pentadactylous; the toes ſlender, and the claws curved. It is found in New Holland.

Section D. Back ciliate, toothed or creſted; head covered with calloſities.

Species.

IGUANA; Common or great American Guana. This ſpecies has a long round tail; back ſerrated; the throat creſt denticulated. This, of all the lizard tribe, is of the moſt peculiar form, and grows to a conſiderable ſize. It is ſometimes three, four, or five feet long. The general colour is green, ſhaded with brown. The back is ſtrongly ſerrated, which, as well as the denticulations of the pouch at the throat, gives it a formidable appearance.

It is a native of the Weſt Indies, and ſome parts of the continent of America. It frequents rocky and woody places, and feeds chiefly on inſects and vegetables. It is eaſily tamed, and follows the human race like a dog; it is caught by a nooſe thrown over its head; the fleſh is reckoned a great delicacy: the general colour is green, but variouſly tinged in various animals: it has the power of inflating the throat pouch to a very large ſize.

According to Cateſby the animals of this ſpecies are of various ſizes, from two to five feet in length; their mouths are furniſhed with exceedingly ſmall teeth, but their jaw is armed with a long beak, with which they bite with great ſtrength. They inhabit warm countries only, and are rarely met with any where north or ſouth of the tropics. Many of the Bahama iſlands abound with them, where they neſtle in hollow trees and rocks. Guanas make a conſiderable part of the ſubſiſtence of the inhabitants of the Bahama iſlands, for which purpoſe they viſit many remote iſlands in their ſloops to catch them, which they do by dogs trained for the purpoſe. Guanas feed on vegetables and fruit, particularly on a kind of fungus growing at the roots of trees, and on the fruits of the anonas. Their fleſh is eaſy of digeſtion, but is thought not to agree with conſtitutions labouring under a particular diſeaſe.

Though guanas are not amphibious, they are ſaid to keep under water above an hour. When they ſwim they make no uſe of their feet, but clap them cloſe to their body, and guide themſelves with their tails. They are ſo impatient of cold, that they rarely appear out of their holes except when the ſun ſhines ſtrongly.

The *horned* guana is a variety of the iguana, and is nearly the ſame in ſize and general proportions; the back is ſerrated, and the form of the ſcales is the ſame. It wants, however, the throat pouch, and there are in front of the head, between the eyes and noſtrils, large ſcaly tubercles, behind which there is a bony conical proceſs, which is covered with a ſingle ſcale. It is a native of St. Domingo, where it is common.

Calotes; Galeot lizard. Tail long and round; back dentated on the fore part, and the head on the hind part.

The animals of this ſpecies ſeldom exceed a foot and a half in length, from the tip of the noſe to the extremity of the tail, but in other reſpects the calotes reſembles the common guana. It wants the pouch, and in its place there is only a ſlight enlargement of the throat: the colour is commonly of an elegant bright blue, variegated with broad, irregular, white, tranſverſe bands on each ſide of the body and tail. The limbs are ſlender, and this is particularly the caſe with the toes. It is a native of the warmer regions of Africa, Aſia, and many of the Indian iſlands. It is very common in Ceylon. It is ſaid to be found in Spain, where it wanders about the tops of houſes in ſearch of ſpiders.

There is a variety, of which the body above is livid, and beneath green: and a ſecond, the neck of which is covered with broad obtuſe prickles.

Superciliosa; Fringed lizard. Tail carinated; back and eye-brows ciliated, with upright lanceolated ſcales. It inhabits South America and India.

The general appearance of this ſpecies bears ſome reſemblance to the guana, and ſtill more to the variety deſcribed as the horned guana, in having the appearance of a pair of ſharp-pointed horn-like proceſſes above and beyond each eye; between theſe are placed ſome aculeated ſcales.

Scutata; Shielded lizard. Tail ſub-compreſſed, moderately long; dorſal ſuture toothed; hind-head with two ſharp ſcales. It inhabits Aſia. This ſpecies is diſtinguiſhed from the fringed lizard by having a proportionably larger head, and a row of ſcales more elevated than the reſt, paſſing over each eye; and from theſe a ridge is continued towards the back, in form of a denticulated creſt to the beginning of the tail. The body is covered with ſmall acuminated ſcales; the limbs and tail with larger ones. This is a native of Ceylon.

Amboinensis; the Amboina lizard. Tail compreſſed, long, with a radiate fin; dorſal ſuture toothed. This ſpecies, which ſometimes grows to the length of three feet, is diſtinguiſhed by the ſingularity of its appearance, and the beauty of its colours. The head and neck are green, and variegated with white tranſverſe undulations. The back and tail are brown, with a ſhade of purple. The ſides and belly are greyiſh, or pale brown, the head is tuberculated above, and covered with roundiſh ſcales; the mouth is wide, and the teeth are ſharp and numerous.

It is a native of the Eaſt Indies, but is found moſt frequently in the iſland of Amboina, frequenting the neighbourhood of rivers and other freſh waters. It is often ſeen on the banks of riſing grounds, and on low ſhrubs which grow near the water. Whenever it is diſturbed by the approach of men or other animals, it plunges into the neareſt water and conceals itſelf beneath the rocks, or ſtones under the banks. It may be eaſily taken, as it does not attempt to defend itſelf, but ſeems, in ſome meaſure, ſtupified. Like other ſpecies of this numerous tribe, it depoſits its eggs in the ſand, on the banks of the rivers which it frequents. The eggs, while in the body of the animal, are diſpoſed in two long groups or cluſters, and are of a yellow colour; but when excluded, they are white and oblong.

This lizard appears in ſome degree to form a connecting link between the guana and the baſiliſk. The male and female differ conſiderably in ſize and in the diſtribution of their colours; the female being of a more obſcure tinge than the male, and having but little appearance of the creſt or proceſs on the tail. It has been diſſected, and a ſmall triangular heart found within it: an oblong liver, with a round gall-bladder; ſmall reddiſh lungs, ſlightly tinged with lead-colour; a narrow, whitiſh ſtomach, coated, or enveloped in fat, and large inteſtines, in which were diſcovered the berries and ſeeds of certain aquatic ſhrubs, together with ſome ſmall ſemi-tranſparent pebbles, and a kind of worms not unlike millepedes. There was a fine ſpecimen of this ſpecies in the Muſeum of the late Mr. John Hunter.

Agama; American galeot. Tail long, round; the upper part of the neck, and the back of the head, are aculeated; ſcales of the hind head reverſed. This ſpecies reſembles, in ſome reſpects, the calotes: but it wants the ſtrong ſerratures on the back, inſtead of which it has only a ſmall denticulated carina. The head is proportionally larger, and on the back part it is furniſhed with ſharp-pointed ſcales, ſome of which are reverſed at the extremities. The colour is browniſh, and variouſly clouded. In the male, the creſt on the back is compoſed of longer ſpines, and extends to the lower part. It is found in different parts of South America and in the Weſt Indian iſlands.

There is a variety of this ſpecies named the muricated lizard. The tail is long, round; body greyiſh; ſcales carinated and ſharp pointed. This lizard meaſures a foot or more in length. The want of the reverſe ſcales on the back part of the head conſtitutes the principal difference between this and the calotes. It is found in New South Wales.

Umbra; Clouded lizard. Tail round, long; nape ſubcreſted; hind-head callous; back ſtriated. This is found in the ſouthern parts of America: the body is clouded; ſcales keeled, and daggered at the tip, head more obtuſe and round than others of its tribe: the *callus* on the hind part of the head is large and naked: under the throat is a deep fold.

Marmorea; Marbled lizard. Tail round, long; throat ſubcreſted, dentate on the fore-part; back ſmooth. It is found in America, and alſo in Spain. Its body is compreſſed; tail ſtreaked, and the claws are black above.

Cristata; Creſted lizard. Tail lanced, ſhort, pinnate; back creſted; body porous, naked. It is of a reddiſh-brown with lead-colour ſpots; creſt reaching from the head to the tail; the head is very thick, obtuſe; ſnout broad; feet cleft; four toes on the front feet and five on the hinder ones; tail bordered on each ſide with a membrane.

Section E. Body naked; feet unarmed; fore-feet four-toed.

Species.

Americana. Tail lanceolate, middle-ſized; back fringed; belly ſpotted with yellow; it is only about four or five inches long, and is found in America. The fore-part of the head is rounded; ſnout broad; body duſky blueiſh, beneath yellow ſpotted with black, ſides pale ochre;

legs without blueiſh, within yellow; a fringe extending from the head to the tip of the tail.

Palustris; Warted newt. Body blackiſh; ſides ſpeckled with white; belly orange, with irregular black ſpots. This ſpecies is ſmall, and bears a conſiderable reſemblance to the ſalamander. It is from five to ſix inches in length. The tail is flat, with thin ſharp edges, and terminating in a point; on each ſide of it in the male there is a ſilvery white broad band, accompanied with a blueiſh tinge. This ſtripe and the dorſal creſt are ſometimes wanting in the female.

It is found in many parts of Europe, but is rarely ſeen in Britain. It frequents ſtagnant waters in cool and ſhady places, and lives entirely on inſects. It is ſaid to be entirely harmleſs with regard to larger animals, but that a fluid is exuded from its ſkin which ſeems to act as a poiſon on ſmall animals.

Lacustris; Fenny-newt. Of this ſpecies there are ſeveral varieties. 1. Black; tail lanceolate, middle-ſized. 2. Much larger; ſpotted with black. 3. Variegated white and yellow, and ſpotted with black. 4. Tuberculate; chin ſpeckled; belly ſpotted; tip of the tail red. 5. Tuberculate; belly ſaffron colour. 6. Head round; black ſpotted with pale yellow. 7. Black with whitiſh bands. 8. Black; beneath dotted with white. This ſpecies, which is found in many parts of the world, is very deſtructive of fiſh.

Aquatica; Water-newt. Tail roundiſh, middle-ſized; there are likewiſe varieties; brown or yellowiſh; and one with a dorſal line dotted with white and black; the firſt is found in many parts of Europe; the ſecond inhabits France; and the third in Germany.

It lives in pools, ditches, and ſtagnant waters, and is killed in three minutes if ſalt be ſprinkled upon it. The body is ſpongy, blackiſh dotted with black; chin rough; back ſubcreſted; tail ſmooth, ſpeckled with a longitudinal white ſtripe on each ſide.

The general length of this ſpecies is from three to four inches. The male is readily diſtinguiſhed from the female by a conſpicuous dorſal creſt, which is more elevated, and more regularly ſinuated than that of the paluſtris. The broad creſt is very tranſparent, and when examined by a magnifying-glaſs ſhews the ramifications of the blood-veſſels and the circulation of the blood. In the female the dorſal creſt is nearly wanting. The fore-feet are tetradactylous; but the hind-feet have five toes, and in all, the claws are wanting; but with regard to colour, the breadth of the tail, and that of the toes, water-newts differ at different ſeaſons of the year, in different ſtates of the weather, and ſometimes a conſiderable variation is obſerved even in the courſe of the ſame day.

This ſpecies is very common in ſtagnant waters. It breeds early in the ſpring, and depoſits ſmall oblong ſtrings or cluſters of ſpawn. The ova are of a kidney ſhape, and the larvæ are ready formed, and may be ſeen active and ſporting before they leave the gluten. They extricate themſelves in about ten days, and when they are firſt excluded, the branchial fins are diſtinctly ſeen, and ſoon after their fore-legs appear. In a fortnight the hind-legs are viſible, and in about four or five months the branchial fins become obliterated, and the animal aſſumes a perfect form. In the larva ſtate, the animal has the appearance of a ſmall fiſh. It caſts its ſkin, which may be found floating on the waters which it frequents, and is ſometimes ſo perfect as to repreſent the whole form of the complete animal. The reproductive power of this ſpecies of lizard has been noticed as a very ſtriking circumſtance in natural hiſtory. They have been known to have their legs, tails, and even their eyes reſtored after they have been deſtroyed. It has alſo been aſcertained that water-newts have been completely encloſed in a maſs of ſolid ice, in which they have remained ſeveral weeks, and yet upon a thaw the little animals have been reſtored to their former health and vigour. We may mention in connection with this a ſpecies deſcribed by Dr. Shaw, denominated the

Leverian Water newt; of which there was a good ſpecimen in the Leverian muſeum. The total length of this is 17½ inches, and its tail is about ſix or ſeven inches of it. The head is flattened, the mouth moderately wide, and the upper jaw is furniſhed in front with two concentric rows of numerous, ſmall, briſtly teeth. The under jaw has only a ſingle row. The eyes are ſmall, round, ſituated on each ſide of the front of the head, ſo that they are remote from each other. The colour is pale brown, marked with darker variegations. The legs are about an inch in length, and they are all furniſhed, along their whole length behind with a dilated ſkin or creſt. The tail is like that of a common water-newt, but ſhorter and not ſo deeply finned.

Salamandra; Salamander. The ſpecific character of this animal is, colour black, ſpotted with golden yellow; tail round, and of moderate length. Of this ſpecies there are, beſides the one deſcribed, ſome entirely black; ſome brown; ſome white; and ſome ſmall, brown; with a tail in ſome degree compreſſed. The ſalamander, ſo long the ſubject of popular error, and of which ſo many idle tales have been recited by the more ancient naturaliſts, is an inhabitant of many parts of Germany, Italy, France, &c. but has not been diſcovered in England. It delights in moiſt and ſhady places, and during winter conceals itſelf in receſſes under ground, in the cavities of old walls, or about the roots of old trees. It is eaſily diſtinguiſhable by its fine colours; being of a deep ſhining black, variegated with large, irregular patches of bright orange-yellow; which on each ſide the back are commonly ſo diſpoſed, as to form a pair of interrupted longitudinal ſtripes; on each ſide of the back of the head is ſituated a pair of large tubercles, which are in reality the parotid glands, that are protuberant not only in this and other ſpecies of the Lacerta genus, but in a remarkable manner in the Rana or frog tribe. See Rana.

Theſe parts, as well as the back and ſides of the body, are beſet in the ſalamander with ſeveral large open pores, through which a peculiar fluid is exuded, ſerving to lubricate the ſkin, and which, on any ſudden irritation, is ſecreted in a more ſudden and copious manner under the form of a white gluten of a ſlightly acrimonious nature; and from the readineſs with which the animal, when diſturbed, appears to evacuate it, has ariſen the long continued popular error of the ſalamanders being enabled to live uninjured in the fire, which it has been ſuppoſed capable of extinguiſhing by its natural coldneſs and moiſture; the real fact is this, that like the other cold and glutinous animals, as ſnails, frogs, &c. it is not quite ſo inſtantaneouſly deſtroyed by the force of fire as an animal of a drier nature would be. The general length of the ſalamander is about ſeven inches, though it ſometimes arrives at a much larger ſize. It lives principally on inſects, ſmall ſnails, &c.; its tongue is not by any means formed to catch theſe in a ſudden manner, being ſhort, broad, and in ſome degree confined, ſo as not to be darted out with celerity. It is capable of living in water as well as on the land, and is found occaſionally in ſtagnant pools. Its pace is ſlow, and its habits torpid. The ſalamander is viviparous, and the young are produced perfectly formed, in the ſame way as the viper. It is ſaid to retire into the water to depoſit its young, the number of which at one birth amounts to 30 or 40; when they are firſt excluded, they are furniſhed with branchial-fins on each ſide the neck; theſe are but temporary organs, and are afterwards obliterated like thoſe of the tadpole.

It has been thought that the ſalamander was a venomous animal, and that its poiſon is of ſo malignant a nature, as ſcarcely to admit of any remedy. Later obſervations and experiments have aſcertained that it is perfectly innocent, and although the fluid ſecreted from the ſkin may be noxious to ſmaller animals, it is incapable of inflicting either wound or poiſon on any large animal.

Strumosa; Strumous lizard. Tail round, long; breaſt gibbous, projecting forward. This is of a ſmall ſize, has no ſerratures, but is furniſhed with a large flat creſt at the throat, of a pale red colour; the other parts of the animal are of a pale blueiſh-grey, with ſome ſlight ſhades of a more duſky hue. The limbs are ſlender. It is a native of South America.

Vittata; Forked lizard. The tail of this ſpecies is round, long; body brown with a white dorſal fillet, forked over the head. It inhabits India; it does not exceed ſix or ſeven inches in length; the head is large in proportion to the body, the toes are lamellated beneath; terminated by curved claws. The upper ſurface is covered with extremely ſmall tubercles, which are ſo minute as ſcarcely to be perceptible.

Turcica; the Turkiſh lizard. Tail ſubverticillate, middle-ſized; body grey, and a little warty. It inhabits the Eaſt. Its body is duſted with brown ſpots, unequal, and as if ſprinkled with ſcarcely viſible warts; the tail is about the length of the body.

Rapicauda; Turnip-tailed lizard. Tail turbinate; ears concave. This ſpecies is found in ſeveral of the American iſlands; the body is white, ſpotted with brown; warts ſmall, thickly ſprinkled; claws hollowed in the middle underneath.

Gecko; Common Gecko lizard. Tail round, middle-ſized; toes a little clawed; ears concave. This animal is ſaid to have received its name from the peculiar ſound of its voice, which bears a reſemblance to that word when uttered in a ſhrill tone. It is twelve or fourteen inches long, and is accordingly ranked among the middle-ſized animals of the lizard tribe; but it is thicker and ſtronger than the greater part of lizards. Its head is flattiſh, ſomewhat triangular, and large, with a covering of minute ſcales; its mouth is wide, eyes large, teeth ſmall, and its tongue is broad and flat. The uſual colour of the gecko is brown, with ſome irregular duſky or blueiſh variegations, but this colour becomes more brilliant in warmer regions.

It inhabits India, Arabia, Egypt, and the warmer parts of Europe; it frequents houſes in ſummer, but is ſeldom ſeen in the winter; makes a noiſe like a weaſel; is tame, and when frighted will run into houſes for ſhelter; it emits a poiſonous fluid from the lamellæ beneath its feet, which, if ſmeared over fruit, or other articles of food it has run over, cauſes a violent colic in thoſe who happen to eat them; it frequently ſtands in an erect poſture on its hind-feet; from the peculiar ſtructure of its feet the animal is enabled to attach itſelf to the ſmootheſt ſurfaces.

There is a variety of this ſpecies denominated *Tokai*, deſcribed by the Jeſuit miſſionaries ſent by Lewis XIV. to Siam; of which the body is covered above by a granulated ſkin, varied with red and blue undulations; the belly is of an aſh colour, and interſperſed with red ſpots; the head is large and triangular. It is a native of Siam, and is regarded as a poiſonous animal. Bontius, in his Hiſtory of Java, appears to deſcribe one of a ſimilar kind, under the name of the Indian ſalamander. It is called Gecko, on account of its ſhrill cry. It is about a foot long, and its colour is ſea-green, ſpotted with red, the head is large and toad-like; the eyes are large and extremely protuberant. It is ſaid that the Javaneſe hold up the animal by the tail to make it diſcharge ſaliva from the mouth, which they collect and preſerve for the purpoſe of poiſoning their arrows.

Geitje. Tail lanceolate, middle-ſized; fore-feet with four toes; this ſpecies is found at the Cape of Good Hope. It is called by ſome naturaliſts *Sparmanniana*, on account of its having been firſt deſcribed by Sparmann. Its colour on the upper parts is a variegation of darker and lighter ſhades, and on the under parts it is whitiſh. It is looked on as a poiſonous animal, and is ſuppoſed to ſecrete from its pores a fluid which produces tumours and even gangrenes, that are ſometimes cured by the application of citron juice, but which, if long neglected, are very productive of dangerous ſymptoms.

Section G. The animals in this diviſion have feet with five toes; ſome of which are connected; the tail is round, ſhort, incurved.

Species.

Chamæleon. Three varieties are mentioned in the Syſtema Naturæ, of which the ſpecific character of the firſt is, body cinereous; head flat; of the ſecond the body is white; and of the third the head is very large.

The chamæleon inhabits India and New Spain; it lives chiefly in trees: from the anatomical deſcription, the lungs are large, and capable of being inflated to an enormous ſize by the animal; the eyes are ſo moveable that the creature can look in different directions at the ſame time; the pupil has a golden glare, and frequently changes its colour.

Few animals have been ſo much celebrated as the chamæleon, which, it was long believed, has the power of changing its colour at pleaſure, and of aſſimilating it to that of any particular object or ſituation. This, however, is not the real ſtate of the caſe; the change of colour which the animal exhibits varies in degree according to the circumſtances of health, temperature of the weather, and other cauſes, and conſiſts chiefly in an alteration of ſhades from the natural greeniſh or blueiſh-grey of the ſkin into pale yellowiſh, with irregular ſpots of dull red. Another erroneous aſſertion with regard to the chamæleon was, that it could ſubſiſt on air. This aroſe from the long abſtinence which it is known capable of enduring.

The length of the chamæleon is about ten inches, but including the tail, it is nearly double that length. The ſkin on every part of the animal is granulated. There are five toes on each foot, two and three of which are united by a common ſkin as far as the claws. The ſtructure of the tongue is peculiar; it is very long, and furniſhed with a dilated ſomewhat tubular tip, by which means it is enabled eaſily to ſeize inſects, by darting it out and ſecuring them on the tip. It is found in many parts of the world, and particularly in India and Africa; and has been ſeen in the warmer parts of Spain and Portugal. For a farther account of this animal, ſee Chamæleon.

Africana; or African lizard. Black; head carinate; it inhabits the northern parts of Africa and Spain; in its habits it reſembles the chamæleon; the protuberant parts are all white.

Pumilla; Dwarf lizard. Sides blueiſh, with two yellowiſh lines; it is found at the Cape of Good Hope. In this ſpecies the head is ſomewhat flatter than that of the Africana, but ſtill elevated in the middle, and edged on each ſide with a denticulated margin. The Africana and the Pumilla have been regarded, by ſome naturaliſts, as varieties of the ſame ſpecies.

Section H. The animals of this diviſion have their collar double; and ſquare abdominal ſcales.

Species.

AMEIVA; the blue lizard. Tail verticillate, long; abdominal ſcales thirty; collar beneath with a double wrinkle. It inhabits America, but occurs in Africa and Aſia. The abdominal ſcales are in eight rows.

TILIGUERTA. Tail verticillate; twice as long as the body, abdominal ſcales eighty. It is about ſeven or eight inches long, and is found during the whole year in the fields and meadows of Sardinia.

AGILIS; Scaly or green lizard. Tail long, verticillate, with ſharp ſcales; collar is ſcaly beneath. This elegant ſpecies, which is found in all the warmer parts of Europe, varies in length from fifteen inches to two feet. It is the moſt beautiful of all the European lacertæ, exhibiting a rich and varied mixture of darker and lighter green, interſperſed with ſpecks and marks of yellow, brown, blackiſh, and even ſometimes red. The head is commonly of a more uniform green than the reſt of the body; the under part of the animal, both on the body and limbs, is of a pale blue-green caſt; the head is covered with large angular ſcales; the reſt of the upper parts with very ſmall ovate ones; the tail, which is commonly longer than the body, is marked with numerous rings of oblong-ſquare ſcales, ſlightly bifid at their extremities; beneath the throat is a kind of collar, formed by a row of ſcales of much larger ſize than the reſt: the abdomen is covered, down its whole length, with ſix rows of broad tranſverſe plates, and the under ſurface of the limbs is alſo covered with ſimilar ſcales; along the inſide of the thighs runs a row of papillæ or tubercles, about thirteen in number, which, in this and other ſpecies, probably aſſiſt the animal in climbing or clinging to the ſtems and branches of vegetables; the tongue is moderately long, and formed to enable the animal to retain and ſwallow its prey, which conſiſts chiefly of inſects, ſmall worms, &c.

This ſpecies is a native of all the warmer parts of Europe. It is found in gardens, about and in crevices of warm walls, buildings, &c. It is, as its name imports, a very active animal, and purſues its prey, which conſiſts of inſects, with great celerity. When it is caught it may be tamed, and it ſoon becomes familiar.

It appears to run into numerous varieties both as to ſize and colour; but in them all the particular characteriſtics of the ſpecies are eaſily aſcertained. Beſides the one already deſcribed, we have in the Syſt. Nat. the following varieties: 1. One in which the loweſt ſcales of the collar are looſe. 2. That in which the ſkin is very thin and of a brown colour. 3. Body with eye-like ſpots. 4. Brown; on each ſide a ſeries of indiſtinct ſpots. 5. Sides brown; back tawny. 6. Blueiſh; each ſide a triple row of ocellate ſpots. 7. Green ſpeckled with brown; collar tawny. 8. Blue; head white; back longitudinally ſtriate; hind-legs ſpotted. 9. Blue; the ſides ſpeckled with white.

The 8th, found in America, is deſcribed as innocent, active, elegant, living in dry meadows, walls, and rocks. Some of the animals of this ſpecies have been uſed as a medicine, and have been ſuppoſed to poſſeſs peculiar virtues in leprous and other ſimilar caſes.

SEPS; the eft. Tail verticillate, long; lateral ſuture reflected, ſcales ſquare.

This is a ſmall ſpecies, and is eaſily known from the thin lengthened form of the body, and its long ſlender tail. There are three varieties, the firſt anſwers to the ſpecific character given; the ſecond is variegated with cheſnut; head varied with black and white; the third is black-blue, marbled with confluent white bands mixed with round ſpots. It inhabits ſouthern countries. The body is covered above and beneath with truncate ſcales in eight rows, forming lateral and longitudinal ſtreaks, belly flat; tail with about 50 whorls, half as long again as the body; legs ſhort, diſtant, but well formed for running. See EFT.

VELOX; Swift lizard. Tail verticillate, longiſh; collar beneath ſcaly, body above cinereous, varied with five longitudinal paler ſtreaks and brown dots; ſides ſpotted with black, dotted with blueiſh.

This ſpecies is found in Siberia, particularly in the ſultry deſert places about the lake of Inderſkien; it wanders among the rocks, and is exceedingly ſwift; it reſembles the ſcaly or green lizard, but is much ſlenderer and leſs; hind-legs marked with round patches.

CRUENTA; Red-tailed lizard. Tail verticillate, above cinereous, beneath ſcarlet with a whitiſh tip; fold of the neck beneath tranſverſe. This ſpecies is found about the ſalt lakes in ſouthern Siberia; reſembles the velox in ſhape, but is three times as ſmall, and has a ſharper head. The body is brown, with ſeven white ſtreaks on the neck, of which four reach the tail, beneath is white; limbs varied with round milky ſpots; thighs without the line of callous dots.

ARGUTA; the argute lizard. The ſpecific character is this; tail ſhort, verticillated; thick at the baſe and filiform at the tip; collar marked with obſcure ſcales. There is a remarkable double plate under the neck.

The ſpecies is ſimilar in ſome reſpects to the green lizard, but is ſhorter and more ventricoſe, and has a ſharper ſnout. It is a native of the ſouth of Siberia, and is found in the dry ſunny places of Irtiſh, and on the ſandy plains beyond.

ALGIRA. Tail long and verticillated, and two yellow lines on each ſide the body; it is a ſmall ſpecies, of about a finger's length; it is brown above, and beneath yellowiſh; back covered with carinated ſcales, and bounded on each ſide by a yellow line, ſeparating the abdomen from the upper parts. It is a native of Algiers.

TILIGUGU; Sardinian lizard. Tail round, conic, middle-ſized; toes five marginate claws.

It inhabits Sardinia, and is eight inches long. The body is thick, brown above, variegated with numerous black dots, beneath whitiſh; legs very ſhort, the hinder ones longer; tail three inches and a half long.

URALENSIS; Ural lizard. Tail round, longiſh; neck beneath folding; feet all-toed; back livid-aſh, wrinkled, and ſubwarted.

It inhabits the country about Ural, is four inches long; very ſwift. The head is roundiſh; body whitiſh beneath.

BULLARIS; Bladder lizard. Tail round, long; chin pouched.

This ſpecies is about ſix inches long, of a ſhining graſs-green colour. When it is approached, the throat ſwells into a globular form, and the protruded ſkin becomes of a bright colour. This has been thought to be a threatening aſpect, but probably without any foundation. It is a native of Jamaica, where it is common about hedges and trees. The green Carolina lizard is ſuppoſed to be a variety of this ſpecies, as it is an exact reſemblance in every reſpect, except in the appearance of the pouch. In dry hot weather it appears of a bright green colour; but in cold weather it changes to a brown. It is very common in and about the houſes of Carolina.

AURITA; Eared lizard. Tail round, middle-ſized, with callous dots on each ſide; the throat fold tranſverſe, almoſt double; angles of the mouth each ſide dilated into a ſemiorbicular, ſoft, rough, dentate creſt. This ſpecies is found among the ſandy hillocks of ſouthern Siberia, and gravel-pits in the deſert of Comani, it is ſomething larger than the gecko; the upper part waved with cinereous and yellowiſh, and thickly ſpeckled with brown; underneath it is whitiſh; tip of the tail and blotch on the cheſt black.

TEGUIXIN. Tail round, long; lateral ſuture folded; neck beneath wich a triple fold. Inhabits India and South America. Back and tail verticillate with crowded ſtreaks.

HELIOSCOPA; Star-gazing lizard. Tail imbricate, tapering; neck with a tranſverſe fold beneath; head covered with calloſities. This ſpecies inhabits in vaſt numbers the burning ſand-hillocks of ſouthern Siberia; moves very quick, but in a leſs ſerpentine direction than the ſcaly lizard; holds its head very erect with its eyes turned upwards, and is about two inches long. The colour of the upper parts of the body is grey, with brown and blueiſh ſpots, and linear ſtreaks. The neck is often marked above with a red ſpot. The tip of the tail is red beneath.

PLICA; Plica lizard. The hinder part of the head is callous; eye-brows excoriated above; neck plaited beneath, and warted at the ſides; tail long and round. This is a ſmall ſpecies, about two or three inches in length. It is entirely covered with conical ſcales; there is a double plate beneath the throat. It is a native of South America and India.

Section I. Body lineate or banded, ſcaly; tongue bifid.

Species.

SEXLINEATA; Six-lined lizard. Tail verticillate, long; back with ſix white lines. It inhabits Carolina. The back is hoary, with three narrow white lines and three black; under the neck are two wrinkles; thighs with a row of callous dots behind.

QUINQUELINEATA; Five-lined lizard. This alſo is an inhabitant of Carolina. The head is marked with ſix yellow lines, and two between the eyes; back is blackiſh, with lines reaching to the middle of the tail; the tail half as long again as the body; the belly is ſtreaked imbricately.

NILOTICA; or the lizard of the Nile. Tail long, the outer ſide triangular; body ſmooth; back with four lines of ſcales. It is found in Egypt.

INTERPUNCTATA; Aſiatic lizard. Tail round, long; back with yellow lines, interſperſed with black dots. Inhabits different parts of Aſia. Body included between two lines and diſtinct from the ſides. In the area are ſix longitudinal rows of brown dots, and as many on each ſide; legs and tail dotted in the ſame manner.

LEMNISCATA; Eight-lined lizard. Tail round, long; back with eight whitiſh lines. It inhabits Guinea. The thighs are dotted with white.

FASCIATA; Blue-tailed lizard. Tail round, long, blue; back with five yellowiſh lines. Inhabits Carolina.

VULGARIS; Brown lizard, or common Newt. Tail round, middle-ſized; feet clawed; fore-feet four-toed; back with a double brown line.

It inhabits Europe, and is about three inches long. It is found in gardens, in the neighbourhood of dunghills, &c. Like the ſlug and toad it makes its way into cellars. It is altogether a land ſpecies, and it ſeems to be viviparous.

JAPONICA; Japoneſe lizard. Tail round, long; feet clawed; fore-feet four-toed; back banded. Body beneath yellow; the upper part is livid, with a dentate broad yellow band from the hind-head to the tip of the tail; eyes ſmall; eye-brows large, rough; claws black; tail a little compreſſed at the tip. It is found in the Japan iſlands.

DESERTI; Ural lizard. Tail round, longiſh; feet five-toed; body above black, with ſix white longitudinal lines. It is found in the deſert of Ural, and is ſomewhat more than two inches long. The body beneath is white; lines of the back conſiſting of oblong ſpots, and between each outer line, and the next, are five white dots.

QUADRILINEATA; Four-lined lizard. Tail round, long; feet ſomewhat clawed; hind-feet four-toed; body with four yellow lines. It inhabits North America.

PUNCTATA; Dotted lizard. Tail round, middle-ſized; feet unarmed; fore-feet four-toed; back longitudinally dotted with white. It is found in Carolina. The body is brown, with a double row of white ſpots on the back, and a ſingle one on the tail.

SPUTATOR; Spitting lizard. Tail round, middle-ſized, with a longitudinal row of ſcales beneath; feet unarmed, five-toed; body cinereous, with white bands above, before and behind it is edged with liver colour. It is found in South America, in houſes and among old buildings; when irritated, it diſcharges a black acrid matter, the effects of which on the human body may be cured by camphor or ſpirits of wine. The whole animal, except the very tips of the jaws, and the lower ſurface of the tail, is covered with minute truncate ſcales; the tongue is round, a little notched at the tip; tail near the end, and legs ſpotted with brown.

Section K. The belly of the animals of this diviſion is covered with imbricate ſcales; the tongue is entire.

Species.

SEPIFORMIS. Tail ſhort; body greeniſh-black; head armed; back flat; hind-thighs on the hinder part covered with callous dots.

SCINCUS; Scink. Tail round, middle-ſized, compreſſed at the tip; toes unarmed, marginate. This ſpecies is thus characterized by Dr. Shaw. "Yellowiſh-brown lizard, with tranſverſe brown bands on the upper part, ſhort tail with compreſſed tip, and upper jaw longer than the lower."

"The ſcink," ſays the writer juſt quoted, "is one of the middle-ſized or ſmaller lizards, and is a native of many of the eaſtern parts of the world. It abounds in Lybia, Syria, Egypt, and Arabia, frequenting moderately dry and ſandy ſoils, and growing to the length of ſix or ſeven inches, or even ſometimes more. The head of the ſcink is large, the body thick and round, and the tail conſiderably ſhorter than the body."

It is of a pale yellowiſh-brown colour, with a few broad, duſky, tranſverſe undulations or zones, and is uniformly covered with moderately large or fiſh-like ſcales, lying extremely cloſe and ſmooth, ſo that the ſurface has a gloſſy or oily appearance. It is an animal of harmleſs manners, and like moſt lizards derives its ſubſiſtence from various inſects, which wander about the regions that it inhabits. It was once in high eſtimation as an article in the Materia Medica.

Mr. Bruce, in his Travels, has deſcribed the ſcink under the name of El Adda, which, he ſays, is very common in the province of Atbara in Abyſſinia. (See *El* ADDA.) It burrows in the ſand ſo quickly, that it is out of ſight inſtantly, and appears rather to have found a hole than made one, yet it comes out in the heat of the day to baſk in the ſun; and if not very much frightened, will take refuge behind ſtones, or in the withered, ragged roots of the abſinthium, dried in the ſun to nearly its own colour. It has long legs, but makes no uſe of them to ſtand upright; it creeps with its belly almoſt cloſe to the ground; its motions are, however, very rapid. Mr. Bruce informs us, that lizards in general are peculiarly numerous in the eaſtern regions. The deſert parts of Syria bordering on Arabia Deſerta abound with them to ſuch a degree, as to render it impoſſible to count them. "I am poſitive," ſays the traveller, "that I can ſay, without exaggeration, that the number I ſaw one day in the great court of the temple of the ſun at Balbec, amounted to many thouſands; the ground, the walls, and ſtones of the ruined buildings were covered with them, and the various colours of which they conſiſted made a very extraordinary appearance, glittering under the ſun, in which they lay ſleeping and baſking.

Scincoides; Scincoid lizard. Tail round, middle-ſized; legs ſhort; toes very ſhort.

This ſpecies is a variety of the *occidua* of Dr. Shaw, to which he gives the name of the galliwaſp. It is nearly two feet long, according to him; but Gmelin makes it about eighteen inches only. It is a native of New Holland. The body is a pale yellowiſh-brown, with a long patch of deep brown or blackiſh each ſide the neck; ſides tinged with the ſame colour; tail deeper than the ſides; teeth ſomewhat obtuſe, ſhort. The tongue in this, as in other ſcinks, is ſhort, flat, rounded and entire; not forked, as in moſt lizards.

The occidua or galliwaſp itſelf is a native of the American iſlands, and is particularly common in Jamaica, where it frequents woody and marſhy diſtricts. Its colour is uſually a paliſh brown, clouded with ſomewhat irregular bands of a deeper caſt; but it is ſaid occaſionally to change its colour into a lively golden yellow. It was formerly thought to be the moſt venomous reptile in the iſland of Jamaica, and it was ſaid that no creature could recover from its bite; but this is now regarded as a popular error.

Ocellata; Ocellate lizard. Tail roundiſh, ſhort; body beneath white, above greeniſh-grey, with roundiſh ocellate ſpots, brown on the margin, rectangular and white on the diſk. It is found in Egypt, is very beautiful, and about a ſpan long.

Guttata; Spotted ſcink. Tail round, long, the tip and four tranſverſe ſpots black; body above hoary, dotted with white, beneath whitiſh.

It is a very ſmall ſpecies, not much exceeding three inches in length. It inhabits the deſerts of Ural. The body is ſmooth above; the feet are five-toed, with claws.

Section L. The animals of this diviſion crawl on the belly; reſembling both the lizard and ſerpent.

Species.

Chalcides. Tail round, long; feet five-toed; legs very ſhort. Inhabits ſouthern Europe and Africa. It is found of different ſizes, from the length of a few inches to that of a foot, or even more. The head is covered in front with large ſcales, and is terminated by a ſlightly tapering, but not pointed, ſnout; the eyes are ſmall, and the openings of the ears very diſtinct. There is no neck, the diameter continuing nearly equal from the head to the beginning of the tail, which is often longer than the body, and gradually tapers to a ſmall point. The colour of this animal is pale ferruginous, or cheſnut brown; hence its name, with ſome naturaliſts, is the "Ferruginous lizard."

In the living animal, the colour is generally ſaid to have a kind of metallic or braſſy caſt, which probably gave riſe to the ſpecific appellation "Chalcides," and "Chalcidica."

"This ſingular lizard," ſays Dr. Shaw, "is deſcribed by Linnæus as having feet furniſhed with five toes; but whatever may have been the caſe with the individual ſpecimen which he examined, it ſeems pretty certain that the general number is three. In the Britiſh Muſæum is an elegant ſpecimen. The chalcides is an animal of a very harmleſs nature, frequenting moiſt ſhady places, moving rather ſlowly, and feeding on inſects, ſmall worms, &c. It is a viviparous ſpecies, and is ſaid to produce a great many young. The ſerpents to which it bears the neareſt alliance, in point of form, are thoſe of the genus anguis, and particularly the A. fragilis, or common ſlow-worm."

The "Chalcide," deſcribed by the count de Cepede, appears to be extremely allied to the one juſt mentioned; but, inſtead of having imbricated ſcales, it is marked into a continual ſeries of annuli throughout its whole length.

Serpens; Serpent lizard. Head, body, and tail, a continued cylinder; legs very minute, remote, five-toed, and clawed. It inhabits Java; is about four or five inches long. Its ſhape is very much like that of a ſerpent, but more conical; the upper part of the body is decorated with from fourteen to twenty brown, longitudinal ſtripes; beneath it is ſilvery. It has an auditory canal.

Anguina; Snake lizard. Tail verticillate, ſtiffiſh at the extremity; body ſtriate; feet without toes, ſubulate. The animals of this ſpecies are about fourteen inches long, of which the body itſelf is only four. The head is rather ſmall; the noſe taper; the legs very ſhort, placed near the head and vent, and apparently terminating in one undivided toe or proceſs; the whole animal appears covered with ovate ſcales, and is brown above, aſh-coloured on the ſides, and yellowiſh beneath; the upper ſurface is marked throughout its whole length by ſeveral dark lines or ſtripes. It is a native of the Cape of Good Hope, where it is found in great plenty in the water, and about the rocks in the Table bay.

Lumbricoides; Lumbriciform lizard. Body ſubequal, round, ferruginous, teſſellate with ſquare ſtreaks; beneath paler; there are no hind-feet, but the others are ſhort and four-toed. This is the la cannellè of the count de Cepede, who firſt deſcribed it in his Hiſtory of Oviparous Quadrupeds. Its length is about eight inches, of which the tail is only one inch. Along the whole body, from head to tail on each ſide, runs a continued ſulcus or channel, ſeparating the upper and lower ſurfaces; legs only two, extremely ſhort, placed near the head, and divided into five minute toes with claws. Colour of the living animal ſuſpected to be green; paler beneath. It inhabits Mexico.

Bipes; Biped lizard. Body ſubequal, round, pale, imbricate; each ſcale with a brown dot. There are no fore-feet; hind-feet with two toes. This is a very ſmall ſpecies, ſaid to be found in South America and in India. Its length is ſix inches; the diameter no larger than that of a good-ſized gooſe-quill. This lizard was deſcribed by Linnæus in the Muſæum Adolphi Frederici, as a ſpecies of ſnake, under the title of "Anguis bipes."

Apus; Cylindrical lizard. Head, body, and tail, a continued imbricate cylinder; it has no fore-feet, and ſcarcely any that can be ſo called behind. This ſpecies is a ſtill nearer approach to the ſnake tribe than even the chalcides. It is a native of Greece, the ſouthern parts of Siberia, and probably of many other parts of Europe and Aſia. It is ſometimes full three feet long, and ſo perfectly reſembles the general form of a large ſnake, that it requires very cloſe inſpection to find that it belongs to the race of lizards. It inhabits the graſſy meadows of the deſerts of ſouthern Siberia, and near the rivers Sarpa, Cuma, and Terek. Though in general appearance it reſembles a ſnake, in its internal ſtructure it is formed like a lizard.

Two ſpecimens of this lizard were brought from Greece by Dr. John Sibthorp, profeſſor of botany in the univerſity of Oxford.

Having, in the foregoing account, followed the Linnæan ſyſtem, with ſuch occaſional additions and illuſtrations as occurred from other writers of diſtinguiſhed reputation; we ſhall conclude with noticing ſome ſpecies which later naturaliſts have added to this genus, and which have been deſcribed, and moſt of them figured, in the intereſting works of Dr. Shaw. Of theſe the firſt is the

Acanthura. The ſpecific character of this is as follows: Throat plaited beneath; the body covered with minute ſcales; the tail long, and verticillated with carinated triple-ſpined ſcales. A ſpecimen of this animal is preſerved in the Britiſh Muſæum. Its length is a foot and a half; the head reſembles that of the ameiva and teguixin, is covered with rather ſmall ſubhexagonal ſcales, and is very diſtinctly marked off, as it were, from the body; beneath the throat is a conſpicuous tranſverſe plait; the whole ſkin about the neck, throat, and beginning of the ſides, is very lax, ſo that it is thought in the living animal the ſkin beneath the throat may have a kind of pouch appearance, though entirely without any middle carina on that part; the feet are all pentadactylous, and the toes rather long. The colour of this ſpecies on the upper part is glaucous, variegated with a few ſmall and ſomewhat indiſtinct clouds and marblings of a whitiſh caſt; the tail and under parts are of a pale or yellowiſh-white colour. Dr. Shaw ſays, this ſpecies is much allied to the quetzpaleo of Seba, which is generally ſuppoſed to repreſent the azurea of Linnæus.

Lophura. Body covered by diſſimilar ſcales; the back ſerrated; the tail is long and carinated. This is a very large ſpecies, reſembling the teguixin in ſize, colour, and ſome other reſpects, but is coated with ſcales of diſſimilar ſize on different parts. Specimens are found in the Britiſh Muſæum, and in that of Dr. William Hunter.

Erythrocephala. Blackiſh-green, with tranſverſe black undulations; abdomen longitudinally banded with black, white, and blue; the breaſt black, and the top of the head red. This, which is reckoned a middle-ſized ſpecies, is a native of the iſland of St. Chriſtopher, and is deſcribed by the count de Cepede. Colour deep or dark green above, mixed with brown; back marked by ſeveral tranſverſe black undulations; top of the head and part of the ſides of the neck red; throat white; breaſt black; belly variegated with longitudinal black, blue, and whitiſh bands, and covered with ſcales or plates. The head is covered with larger ſcales than the other parts; beneath the thighs is a row of tubercles.

Teniolata. Lizard with long round tail, and body marked above with black and white ſtripes; beneath it is white. This ſpecies, allied to the faſciata, is covered entirely with ſcales; colour cheſnut brown above; pale or whitiſh beneath; on the back ſix narrow white linear ſtripes, the intermediate ſpaces of the central and lowermoſt ſtripes being black; the tail is long and narrow; limbs ſtriped longitudinally with black. It is ſlender, five-toed, and a native of New Holland.

Sinensis. Tail flat, all the toes unguiculated, and the face perforated by ſeveral pores. This ſpecies, which is omitted in the Syſt. Nat., was firſt deſcribed by Oſbeck, who obſerved it in China, where it is frequently ſeen in houſes, running about the walls, and climbing with extreme readineſs on the ſmootheſt ſurfaces, preying chiefly on the ſmaller kind of blattæ.

Fimbriata. Body with a membranaceous fimbriated border on each ſide of the body, tail flat, and lamellæ of the feet divided by a furrow. This ſpecies was firſt deſcribed by the count de Cepede, who informs us that it appears in ſome degree to connect the chamæleon, the gecko, and the water-newts: the head, ſkin, and general form of the body, reſembling thoſe of the chamæleon; the tail, that of the water newts; while the feet reſemble thoſe of the gecko.

The colour of this animal is not conſtant or permanent, as in moſt of the lizard tribe; but variable, as in the chamæleon, preſenting ſucceſſively ſhades of red, yellow, green, and blue. This variation of colour is confined to the upper ſurface of the animal; the lower always continuing of a bright yellow. Theſe ſeveral changes have been obſerved in the living animal in its native country, Madagaſcar, where it is rather common, and where, though harmleſs, it is held in great abhorrence by the natives, who believe that it darts on their breaſt, and adheres with ſuch force by its fringed membrane, that it cannot be ſeparated from the ſkin without being cut off. Its reſidence is on the branches of trees, where it lives on inſects, holding itſelf ſecure by coiling its tail half round the twig on which it ſits. It chiefly appears in rainy weather, when it moves with great agility, often ſpringing from bough to bough.

Lizard, *Devil.* See Maboujas.

Lizard, *Fly-catching.* See Gobemouch.

Lizard *Iſland*, in *Geography*, one of the iſlands called "Direction iſlands," in the South Pacific ocean, about 240 miles in circumference, and in general rocky and barren. Captain Cook gave it the name on account of the number of lizards, ſome of which were very large, which he found upon it; 20 miles N.E. of Cape Flattery.—Alſo, one of the ſmaller Bahama iſlands.

Lizard *Point*, or *The Lizard*, a promontory on the ſouth coaſt of Cornwall, and the moſt ſouthern point of land in England, at the north entrance of the Engliſh channel. N lat. 49° 59′. W. long. 5° 12′.

Lizard, in *Naval Rigging*, an iron thimble ſpliced into the main bow-lines, and pointed over to hook a tackle to.

Lizard's *Tail*, in *Botany*. See Saururus.

LIZENED Corn, in *Agriculture*, a term provincially uſed for ſhrunk or lank corn.

LIZIERE, the ſame with *berme*, *foreland*, or *relais*.

When this ſpace is covered with a parapet, it is called a fauſſe-braye, or low wall.

LIZOU-TCHEOU, in *Geography*, a city of China, of the firſt claſs, in the province of Quang-ſi, on the river Long. N. lat. 24° 12′. E. long. 108° 47′.

LIZY-sur-Ourcq, a town of France, in the department of the Seine and Marne, and chief place of a canton, in the diſtrict of Meaux. The place contains 1200, and the canton 11,885 inhabitants, on a territory of 245 kiliometres, in 28 communes.

LLALA, a town of Peru, in the audience of Lima; 100 miles N. of Lima.

LLAMA, or Glama, in *Zoology*. See Camelus.

LLANBADARN-Vawr, in *Geography*, a market town and pariſh in the hundred of Genecin Glyn, Cardiganſhire, Wales. This place is ſuppoſed to have been anciently called *Mauritania*, and to have changed its name in the ſixth century, in memory of St. Paternus, who built a monaſtery here, which was afterwards conſtituted an epiſcopal ſee. This dignity it retained till the inhabitants, quarrelling with the biſhop, murdered him, when it was united to the ſee of St. David's. The government of the town is veſted in a portreve. It has a ſmall harbour; but the little trade it formerly poſſeſſed has of late years been transferred to Aberyſtwith. The market for meat is now likewiſe held at the ſame place, ſo that this town is much declined. The ancient church, built in the form of a croſs, and ſurmounted by a maſſive ſquare tower, is a large edifice, in an early ſtyle of architecture. It is remarkable as the ſeat of one of the oldeſt biſhoprics in Wales. The interior contains a few modern monuments, one of which was raiſed to the memory of Lewis Morris, the celebrated author of the "Celtic Remains." In the church-yard is an ancient croſs, finely decorated with fret-work. The pariſh is very extenſive, and contains a number of hamlets, of which Aberyſtwith is the largeſt and moſt populous. The waſte lands, or commons, may be about 8000 acres. Several old Britiſh forts and tumuli can eaſily be traced in different parts of it. In a vale, called Dyfryn caſtell, is a circle of ſtones, which tradition informs us was a Druidical temple and court of judicature. This town and pariſh were entirely laid waſte by the Danes in the year 988. The town was ſoon rebuilt; but in little more than thirty years after again ſuffered a ſimilar fate, being burnt to the ground by Gruffydd al Llywellin, during his conteſt for the ſovereignty of this diſtrict with Howel ap Edwin. The houſes in this pariſh, according to the parliamentary returns of 1800, amounted to 249 in number, and the inhabitants to 1228. For an ample and intereſting account of this pariſh and the county, the reader is referred to a volume recently publiſhed by S. R. Meyrick, entitled "The Hiſtory and Antiquities of the County of Cardigan," 4to. 1808.

LLANBEDER, Llampeter, or *Llanbedrpont-Stephen*, a market-town and pariſh in the hundred of Modwin, and county of Cardigan, South Wales. It is a corporation, governed by a portreve, bailiff, and town-clerk, and joins with Cardigan, Aberyſtwith, and Aſpar, in returning one member to parliament. The addition of Pont-Stephen to the name of this place is ſuppoſed to have ariſen from the circumſtance of king Stephen having thrown a bridge over one of the principal trenches of a camp in this vicinity. The market is held here on Tueſday. The principal traffic conſiſts in horſes, cattle, and hogs, vaſt numbers being bought for the Engliſh markets. The foundations of a noble caſtle, which anciently ſtood in this neighbourhood, can ſtill be diſcovered at a very ſhort diſtance from the town. The old family manſion of the Lloyds forms a very curious and pictureſque object. It is ſurmounted by four lofty turrets, which, peeping through a thick planted incloſure, have a ſtriking appearance. The pariſh is ſmall, and the ſoil remarkably unproductive, though much improved of late years, by the free uſe of lime. The houſes, according to the parliamentary returns of 1800, amount to 161 in number. The inhabitants were eſtimated at 669. Meyrick's Hiſtory, &c. of Cardiganſhire, 4to. 1808.

LLANDAFF, *i. e.* the church upon the Taff, a city in the hundred of Kibbor, and county of Glamorgan, South Wales. It is watered by the river Taff, which falls into the Severn, about four miles below the town. The name of this place is ſuppoſed to be a corruption of the word Llanar-daff, ſignifying the church on the Taff, the walls of the cathedral burying-ground being cloſe upon its banks. Llandaff, though a very ancient city in appearance, is only a ſtraggling village, placed on an eaſy eminence. The pariſh includes the hamlets of Canton, Elay, Fairwater, Gabalfa, and Llandaff. The pariſh comprehends 2399 acres of land. It has no market; but has the advantage of a tolerably good harbour, which opens into the Briſtol channel. This place is now chiefly ſupported by Cardiff, which is two miles W.N.W. It deſerves notice principally on account of its cathedral-church, which is ſaid to have been firſt founded here ſoon after the introduction of Chriſtianity into Britain, *i. e.* A. D. 186. It was not, however, till the beginning of the ſixth century, that Llandaff was raiſed to the dignity of a biſhop's ſee, by Myric, king of the Silures, who endowed it with all the lands between the rivers Taff and Elwy. The original church being deſtroyed at the time of the conqueſt, or at leaſt its oldeſt part, the preſent was erected in the year 1120, by biſhop Urban. Its ſituation is truly monaſtic, in a bottom ſurrounded by riſing ground. According to Groſe, it meaſures in length, from eaſt to weſt, 263½ feet. The breadth of the body is 65 feet, and the height from the floor to the centre of the roof 119 feet. The weſt front is a beautiful relic of the Norman and pointed ſtyles of architecture united. At the corners of this front formerly roſe two magnificent towers, one of which is now nearly deſtroyed. That on the north-weſt, ſtill remaining entire, is embelliſhed with a profuſion of ſculpture. The entrance on this ſide is under a ſemi-circular arch, over which are three windows, with lancet-ſhaped arches. The interior contains ſeveral monuments of the biſhops; alſo, one in honour of the lady Godiva, the celebrated patroneſs of the men of Coventry. A full deſcription of this church, with views and details, will be found in N° 1. of Cooper's Architectural Reliques. Nothing can exceed the abſurd and fantaſtical appearance of this edifice, when viewed as a whole. Beneath the towers has been ingrafted an Italian ſummer-houſe, with a Venetian window, alſo pilaſters and flower-pot jars upon the parapet. The eccleſiaſtical eſtabliſhment of this ſee conſiſts of a biſhop, as dean, an archdeacon, a ſub-dean, a chancellor, precentor, and nine prebendaries. The choral-ſervice has long been diſcontinued; and the cathedral uſed as the pariſh church. A chapter-houſe, in the kitchen, and an office for the proctor-general, have been erected in the church-yard, where the officers meet once a-year at Peter's-tide, for the auditing of accounts, &c. Two vicars are appointed by the chapter to ſerve Llandaff and Whitechurch alternately. The petty ſeſſions for the hundred of Kibbor are holden at Llandaff. The biſhop has no palace here, nor are there any eſtabliſhed houſes for other members of the church. The dioceſe contains about three-fourths of the county of Glamorgan, and all Monmouthſhire, but ſeven pariſhes. A gate-way and a ruined tower, which formerly contained the great bell called Peter, now at Exeter, are the only remains of the biſhop's palace. The names of the prelates of this ſee have been preſerved by hiſtorians from the period of its erection, though with much uncertainty as to the dates of their conſecrations and deaths, till the cloſe of the ninth century. Llandaff, according to the parliamentary returns of 1801, contains 191 houſes, and 860 inhabitants. Two fairs are held here annually, one on the 9th of February, and another on Whit-Sunday. Brown Willis has publiſhed an hiſtory and deſcription of Llandaff cathedral in 1 vol. 8vo. See Malkin's Account of South Wales, 2 vols. 8vo. and Donovan's Tour through South Wales, &c. 2 vols. 8vo. Hoare's Edition of Giraldus Cambrenſis, 2 vols. 4to. 1809.

LLANDEILO Vawr, a market-town and pariſh in the hundred of Penfedd, and county of Caermarthen, South Wales. The town is ſituated on the declivity of a hill, at the bottom of which flows the river Towy, or Tywi, giving name to one of the moſt delightful vales in the county. The town itſelf has very little to recommend it, the ſtreets being extremely narrow, ſteep, and irregular. The church is an ancient low building, and conſiſts of two aiſles. The pillars which ſupport the roof do not exceed five feet in height. A market, held here every Saturday, is well ſupplied with proviſions. Llandeilo is 15 miles E. by N. from Caermarthen, and 202 W. by N. from London. No leſs than eight fairs are held annually in this town, and another at Fair-Fach, about one mile diſtant. The pariſh comprehends an area of about 16 miles from north to ſouth, by eight miles from eaſt to weſt. About one-tenth part of this land is uncultivated. On an eminence about one mile diſtant from the town, to the S.W. ſtands the pictureſque ruins of Dinevor, or Dinas-fawr caſtle, which commands ſome of the fineſt and moſt romantic views of the ſcenery of Newton-park, and the extenſive vale of Tywi. This caſtle was built by Rhys ap Theodore, in the reign of William the Conqueror. It ſeems to have been originally of a circular form, and ſtrongly fortified by a double moat and rampart. This caſtle was for ſome time the royal reſidence of the princes of South Wales. South from it are the ruins of Cappel yr Ywn, ſtanding between two round towers. It was formerly a chapel of eaſe to the mother-church. At ſome diſtance to the weſtward is Grongar-hill, which has been immortalized by the muſe of Dyer. At a ſhort diſtance, on a rugged hill, ſtand the mouldering fragments of Druſlwyn-caſtle. About four miles S.E. of the town are the pictureſque ruins of Craig-Cenen-caſtell, *i. e.* the caſtle on the rock by the Cenen. The ſituation is ſingularly romantic, being ſeated on an inſulated rock, which was inacceſſible on all ſides but one. It is ſuppoſed to have been erected by Goronw, lord of Is-Cenen, who was one of the knights of king Arthur's round table. The well in this caſtle is conſidered a ſingular curioſity. The farm-houſe, called Cwrt Bryn y Beirdd, which lies about a mile to the ſouth of this caſtle, was formerly a celebrated bardiſh reſidence. Here the river Llychwr takes its riſe, iſſuing with a copious ſtream immediately from the ſolid rock. Cloſe to this ſpring is a cavern, in ſome places ſo narrow, as hardly to permit a perſon to paſs through, but in other parts extremely ſpacious, and exhibiting a variety of beautiful petrifactions. At Llan-de-Faen, which lies to the ſouth-weſt, at the diſtance of four miles, is a well formerly conſidered as very efficacious in paralytic and ſcorbutic affections. Beſides this, there are other chalybeate ſprings in different parts of the pariſh; but none poſſeſs any peculiar medicinal properties. Near Llandeilo-vawr are Talieris-park, the ſeat of lord Robert Seymour; and Edwinsford, the ſeat of J. H. Williams, eſq. The river Tywi, which, paſſing the town, meanders along the vale, abounds with excellent ſalmon-trout and eel. According to the hiſtory of Wales, by Carradoc of Llancarvan, the laſt deciſive battle between the forces of Edward I. and Llewellin, prince of Wales, was fought in this neighbourhood. The victory remained with the Engliſh, and put a final period to the independence of Wales. The inhabitants of Llandeilo, according to the parliamentary returns for 1801, are eſtimated at 647, and the houſes at 141. Wyndham, Skrine, Malkin, Barber, and ſir Richard Hoare, in Giraldus Cambrenſis, have given accounts of this town and its neighbourhood in their reſpective Tours.

LLANDOVERY, or LLAN YM DDYFRI, a market-town and pariſh of Llan-Dingad, and hundred of Penfedd, Caermarthenſhire, South Wales. The town is ſituated on the river Brane, near its junction with the Towey, and conſiſts of five ſtreets, containing, according to Mr. Carliſle, about 800 inhabitants. The buildings of this town have a low and mean appearance. On a mount near the centre of the town, and ſurrounded by a deep trench, are the ruins of a ſmall caſtle, built by Richard de Powers, and it is remarkable for the birth and reſidence of the celebrated Rees Pritchard, (Rhys Prytherch,) well known throughout Wales as author of the "Vicar's Book," a collection of very ſimple poetry. This caſtle was beſieged in 1116 by Gruffydd ap Rhys, who burnt the outer ward, and put a great part of the garriſon to the ſword: but his own troops, in effecting this object, ſuſtained ſo conſiderable a loſs, that he was compelled to raiſe the ſiege. The ſcite of this caſtle is very remarkable, being an inſulated rock of ſome elevation, totally unconnected with any adjacent riſing ground. A handſome ſtone bridge is here thrown acroſs the river Brane. The church ſtands on an eminence at one end of the town. It does not poſſeſs any thing worthy of being particularly noticed. The market is held on Friday every week, and, conſidering the extent of the place, is one of the largeſt and beſt ſupplied in Wales.

Llandovery is undoubtedly a town of conſiderable antiquity: it roſe upon the ruins of a Roman ſtation, which was at or near Llan-Fair-ar-y-Brynn, about half a mile diſtant. That theſe celebrated conquerors had a fixed reſidence there, is ſufficiently clear from the number of Roman bricks, earthen pots, coins, and other remains of antiquity, which have been diſcovered on that ſpot. This town was formerly a contributary borough to Caermarthen, but the privilege has been loſt for a conſiderable period. It ſtill, however, retains its charter, by virtue of which a bailiff is annually elected, as are likewiſe a recorder, a town-clerk, aldermen, and ſerjeants at mace; but their offices at preſent ſeem to be little more than nominal. The county magiſtrates hold here the petty ſeſſions for the upper diviſion of the hundred of Penfedd. It poſſeſſes no leſs than five benefit ſocieties, three for men and two for women, which are ſaid to be extremely advantageous to the ſubſcribers.

The neighbourhood of Llandovery is diſtinguiſhed by a moſt enchanting diſplay of the more placid deſcription of mountain ſcenery. The paſs of Cwm-Dwr, which winds round the Black mountain to the eaſt, is peculiarly fine. On a part of this mountain the decayed town of Trecaſtle is ſituated; but it contains nothing worthy of attention, except the remains of a caſtle erected by Bernard de Newmarch, in the reign of William Rufus. On the ſummit of the Gaer hill is a Roman encampment, part of the fortifications of which are ſtill tolerably entire; and on Pen y Craig an oval one, with three foſſes and two vallums, ſuppoſed to be of Britiſh conſtruction. A monumental ſtone, about ſix feet high, called Maen y Morynnion, is placed on an old Roman cauſeway which joins the road to Brecknock. It ſeems to have been richly ſculptured. The words "Conjux ejus" are the only ones of the inſcription that can now be diſtinguiſhed. Carliſle's Typographical Dictionary of Wales, 4to. 1811. Skrine, Malkin, and Evans's Tours in South Wales.

LLANDRINDOD, or TRINITY-CHURCH, a village of South Wales, in Radnorſhire, near which are medicinal ſprings, much frequented; 8 miles W. of New Radnor.

LLAN-ELLY, a market-town and pariſh in the hundred of Carnwyllion, in Caermarthenſhire, South Wales, contains, according to the parliamentary returns in 1801, 501 houſes, and 2972 inhabitants. The market-days are Thurſday and Saturday. The buildings of the town are irregularly ſituated upon a creek near the ſea-ſhore. At the mouth of this creek is a ſmall iſland, formed by the river Bury, where a monaſtery, founded by St. Piro, formerly ſtood. The church, dedicated to St. Elliw, is an old ſtructure, remarkable for its high, ſquare, embattled tower. The inhabitants of this place are chiefly miners and ſailors. The coal wrought in the vicinity is reckoned remarkably fine. The harbour is tolerably large, and is the controuling port both for Caernarvon and Kidwelly. Two fairs are held here annually; one on Aſcenſion day, and the other on the 30th of September. The pariſh contains about 15,000 acres of land, of which nearly 3000 lie uninclosed and without cultivation. The hamlets are Berwich, Glynn, Hên Coed, Weſtſtowe, and the Borough hamlet. At Berwich and at Ddewi the ruins of two chapels can ſtill be diſtinguiſhed. The chapel of St. John has been lately repaired by ſubſcription, and is at preſent uſed as a meeting-houſe by the Methodiſts. Pembree-hill, a few miles diſtant from the town, commands one of the fineſt and moſt extenſive marine views to be found in any part of Great Britain.

LLANES, a ſmall ſea-port town of Spain, in Aſturias, near the North coaſt; 54 miles N.E. of Oviedo.

LLAN-GADOG-VAWR, a market-town and pariſh in the hundred of Penfedd, and county of Caermarthen, South Wales. The town, which ſtands between the rivers Brane and Sawdde, is tolerably well built, but was formerly much more extenſive than at preſent. It lies about 6 miles S.S.W. of Llandovery, and 190 W. by N. from London. A ſmall manufacture of coarſe woollens and ſtockings is carried on here, principally to ſupply the conſumption of the town. The market-day is Thurſday; and the fairs are held on the 12th of March, the laſt Thurſday of May, 9th of July, the firſt Thurſday after the 11th of September, and the ſecond Thurſday after the 11th of December. The ancient caſtle, mentioned by many touriſts, has been for many years entirely demoliſhed. A collegiate church is ſaid to have been founded here, A.D. 1283, by Thomas Beck, biſhop of St. David's, in honour of St. Maurice and his companion, and St. Thomas the Martyr. This diſtinction ſeems to have been enjoyed but a very ſhort time, if it ever actually took place. The preſent church is dedicated to St. Cadog, and the living is a vicarage in the gift of the biſhop mentioned above. Bledri, the ſon of Cedifor, the great lord of Gwydigada and Elfed, who died in 1119, was buried here. The pariſh contains three hamlets; the hamlet of Dyffryn Caead Rhych, the hamlet of Gwynfe, and the hamlet above the Sawdde. The population, according to the parliamentary report of 1801, amounted to 1821 perſons.

LLANGOLLEN, a market-town and pariſh, ſituated in the hundred of Chirk, and county of Denbigh, North Wales. The houſes of the town have a mean appearance. According to the parliamentary returns for 1801 they amounted to 281, and the inhabitants to 1287. The church is nowiſe remarkable, excepting for the length of the name of its patron ſaint, *i. e.* St. Collen ap Gwynnawg ap Clydawg ap Cowdra ap Caradog Fruchfras ap Lleyn Merim ap Eynion Yrth ap Cunedda Wledig. The market is held here on Saturday every week, and there are four fairs annually. The ruins of Caſtell Dinas Brân nearly cover the ſummit of a vaſt conoid hill, which begins its aſcent near the foot of the bridge oppoſite to the town. This is one of the primitive Welſh caſtles, but the name of its founder is unknown. The form of it is oblong, extending about 300 yards in breadth, and 150 in length. On one ſide of the hill, which is leſs ſteep than the others, deep trenches are cut through the ſolid rock. The materials compoſing this building are the common coarſe ſtone of the country, interſperſed with a few free-ſtone mouldings. In the reign of Henry III. this caſtle ſerved as an aſylum to the traitor Gryffydd ap Madog, who, baſely taking part with the enemies of his country, was compelled to ſecure himſelf in this aerial faſtneſs. It afterwards became the reſidence of Muſamvay Vechan, the beautiful and accompliſhed miſtreſs of Hoel ap Eynion, one of the moſt illuſtrious of the Welſh bards. It is remarkable that this caſtle ſtands at leaſt 600 yards above the level of the ſea: the two ſprings within its walls are never deficient in water. On the north-ſide of the hill may be ſeen a vaſt rock, called Craig Eglwyſeg, or the Eagle's Rock; the ſtrata of which are ſo placed upon one another as to form a ſeries of ſteps parallel with the horizon, known to naturaliſts by the name of Saxa ſedilia. The bridge at the bottom of the hill is one of the moſt beautiful and romantic in Wales, and is generally reckoned among the wonders of the principality. The foundation is on the ledge of a rock. It conſiſts of four arches, the centre one of which is 30 feet in diameter. Tradition informs us it was the work of Trevin, biſhop of St. Aſaph, in the year 1400. About two miles from the bridge ſtands the abbey of de Valle Crucis, one of the fineſt ſpecimens of architectural antiquity in Wales. The weſtern window has been adorned with a variety of ſculptural ornaments, but moſt of them are entirely defaced. Concerning the etymology of the name of this abbey hiſtorians are not agreed; ſome deriving it from the buildings being in the form of a croſs, and others from the circumſtance of its monks having made a preſent of a part of the true croſs to Edward I. At the diſtance of a quarter of a mile hence, is the remainder of a round column, called the pillar of Eliſeg, which is perhaps one of the moſt ancient Britiſh pillars now exiſting. It was entire till the time of the great rebellion, when it was thrown down and broken by ſome ignorant fanatics, on account of its reſemblance, in figure, to a croſs. This pillar has, no doubt, been erected to perpetuate the memory of ſome celebrated chief. It ſtood on a great tumulus, and, when complete, meaſured 12 feet in height. The inſcription was copied by Mr. Edward Llwyd, but it is now entirely illegible. From the ſhape of the letters in the copy taken by that great antiquary, it is concluded to have been written ſome time in the ſixth century. The tumulus was opened ſome years back, when ſome bones were diſcovered placed between flat ſtones.

The beauties of the vale of Llangollen are celebrated both in proſe and verſe. It is watered by the river Deva, and has a canal from the Pont y Cryſylltau aqueduct running throughout its whole length to the Oernant ſlate-quarries. The low price of labour, and the great plenty of proviſions and fuel, have lately induced ſeveral adventurers in the cotton manufacture to eſtabliſh ſome extenſive works in this neighbourhood. The great mail-road from London to Holyhead paſſes through both the vale and town. The pariſh is very extenſive, and is divided into three portions, called Traian y Glynn, Traian Llangollen, and Traian Trevor; each of which contains ſeveral hamlets. We might have mentioned the romantic reſidence of two ladies, who have for many years lived together in the vicinity of this town. It is well known by all touriſts. Pennant, Skrine, Bingley, Wyndham, Evans, Warner, and Hutton have given accounts of Llangollen, and of the principal places in its vicinity, in their reſpective tours in Wales.

LLANNERCH Y MEDD, a market-town, ſituated chiefly in the pariſh of Amlwch, in the hundred of Twr Celyn, and county of Angleſea, North Wales. A market is held here on Wedneſdays, and the fairs on the 5th of February, 25th of April, 6th of May, and Thurſday after Trinity. This town owes its ſupport principally to the circumſtance of its being ſtationed in the neighbourhood of the Parys mountain. The petty ſeſſions are held here. Aikin's Tour in North Wales.

LLANOS, Los, a town of Mexico, in the province of Mechoacan; 100 miles N.N.E. of Mechoacan.

Llanos *De Almeria*, a town of Spain, in the province of Grenada, on the coaſt of the Mediterranean; 20 miles W.S.W. of Almeria.

LLAN RHAIADAR, in Mochnant, a pariſh conſiſting of 17 townſhips, ſituated partly in the hundred of Chirk, and county of Denbigh, and partly in the hundred of Llan-Fyllin, in Montgomeryſhire, North Wales. It lies in a deep hollow, ſurrounded by lofty mountains. The petty ſeſſions for the diviſion of Cynllaeth and Mochnant are held in the village which gives name to the pariſh. William Morgan, D. D. an eminent divine, and the perſon who firſt tranſlated the bible into Welſh, was vicar here, till tranſlated to the ſee of Llandaff, by queen Elizabeth in the year 1595. The buildings of the village are ancient and irregular. The rectory is a ſinecure in the patronage of the biſhop of St. Aſaph. According to the parliamentary returns for 1801, the whole pariſh contained a population of 1869 perſons.

LLANRWST, a market-town and pariſh, ſituated in the weſtern extremity of the hundred of Uwch Dulas, and county of Denbigh, North Wales. The town is watered by the river Conwy, over which, at this place, is a noble bridge of three arches, built by the celebrated Inigo Jones in the year 1636. The market is on Tueſdays, and there are four fairs during the year. Here are held the petty ſeſſions for the hundred. Mr. Burke calls this "the moſt charming ſpot in Wales." In the town is a good market-hall, and a richly endowed free-ſchool. A ſmall trade is carried on in harp-making, and it is the centre of all the buſineſs of the populous vale in which it ſtands. The church is ſuppoſed to have been built in 570, and is dedicated to St. Grwſt, who was a biſhop of London about the year 360. In this church is ſome curious carved work, ſaid to have been brought from the neighbouring abbey of Maenan. Adjoining to it ſtands a chapel, erected by ſir Richard Wynne, after a deſign by the architect already mentioned. Here are a few monuments in honour of the Wynne family, which deſerve the attention of the curious. They are braſſes, each containing, beſides the inſcription, a portraiture of the perſon to whoſe memory they were engraved. An ancient monument of Howel Coytmor has been lately removed from the church to this place. Near it is a large ſtone coffin, ſuppoſed to be that of prince Llewelyn ap Jerwerth, who was denominated Llewelyn the Great. The high road from Shropſhire to Holyhead paſſes through the town. In the neighbourhood ſtands Gwydwhouſe, an ancient manſion, conſiſting of an extenſive pile of buildings, of irregular appearance, but ſufficient to denote the great opulence and ſplendour of its former poſſeſſors. Immediately behind the houſe the ground riſes rapidly to the foot of the perpendicular cliffs which form the weſtern boundary of the valley. All this ſpace is now covered with fine plantations of different kinds of trees. Half way up the rock, on an irregular plain of nearly five acres in extent, are the remains of a terrace, and a handſome domeſtic chapel, in the pointed ſtyle of architecture. About a mile from the town, at the hamlet of Mayne, is a ſpring in high repute for its medicinal virtues. Five miles to the ſouth-eaſt lies the ancient nunnery of Gwythwin, where St. Winefrid is ſaid to have been buried. The box which contained the relics of this ſaint is ſtill pointed out to ſtrangers, but her chapel on the ſouth-ſide is totally demoliſhed. The church-yard contains four upright ſtones, one of which is in the ſhape of a priſm, and bears an inſcription now illegible. North of Llanrwſt, at the diſtance of three miles, the abbey of Maenan formerly ſtood. Its ſcite is now occupied by a large old houſe, built out of the ruins. The reſident population of this pariſh, according to the parliamentary returns of 1801, amounted to 2549 perſons. See the Tours of Pennant, Wyndham, Aikin, Bingley, Skrine, Warner, Evans, and Hutton: all of whom viſited this part of Wales.

LLANSTEPHAN, a village in the hundred of Derllys, and county of Caermarthen, South Wales, is ſeated beneath a hill, in a woody vale; whence the ſituation is peculiarly pictureſque and intereſting. Here is a well, called St. Anthony's, which formerly was in high eſtimation for its medicinal virtues; but it has not been much reſorted to of late years. Here was formerly a caſtle, which is now in ruins. It is ſituated on an eminence, on the weſtern ſide of the entrance of the navigable river Tywi, or Towey. Its broken walls encloſe a large area; and furniſhed with ſeveral encircling earthen ramparts, appear to have poſſeſſed conſiderable ſtrength. This caſtle is ſaid to have been built by the ſons of Uchtred, prince of Merionethſhire, A. D. 1138. There is a handſome modern houſe on the hill on which the caſtle ſtands. The pariſh of Llanſtephan, which includes the hamlets of Aliſton, Laques, and Llan y Bre, contained, according to the return to parliament in 1801, a population of 974 perſons, inhabiting 205 houſes. Carliſle's Topographical Dictionary of Wales, 4to. 1811.

LLANTRISSANT, a borough and market-town in the hundred of Miſkin, and county of Glamorgan, South Wales, is ſituated near the ſummit of a cleft in one of the high hills which abound in the vale of Glamorgan. The only acceſs to it is by a ſteep circuitous road. One narrow irregular ſtreet, compoſed of poor habitations, makes up nearly the whole of this place. The church is a large Norman ſtructure. The cemetery affords a very extenſive proſpect. Here was an ancient Norman caſtle, of which but little now remains, except the fragment of a circular tower; the veſtiges of the outworks being nearly concealed by ſhrubs. Within the precincts of the caſtle are the town-hall and market-houſe, new buildings erected by the late earl of Bute. The borough is governed by a portreve, and unites with Cardiff, Swanſea, &c. in ſending one member to parliament. Llantriſſant is diſtant from Llandaff 10 miles, and from London 170: a weekly market is held on Friday, and three fairs annually. In the year 1801, the pariſh was returned as containing 376 houſes, inhabited by 1715 perſons. Barber's Tour in South Wales, 8vo.

LLANVYLLING, a market-town in the hundred to which it gives name, in the county of Montgomery, North Wales, is ſituated in a pleaſant valley, near the river Cane, 15 miles from Montgomery, and 186 from London. The town is neat, and many of the houſes are well built. It was firſt incorporated by Llewellyn ap Gryffydd, lord of Mecham and Mochnant, in the reign of Edward I.; and is governed by two bailiffs, choſen annually, who are juſtices of the peace during the time of office. Many Roman coins have been found here. Four fairs are held annually, and a weekly market on Tueſday. According to the population report of the year 1801, Llanvylling contained 444 houſes, and 1394 inhabitants. Pennant's Tour in Wales, and Skrine's Tour.

LLANWRTYD Wells, a medicinal ſpring of South Wales, in the county of Brecon; 12 miles W. of Builth.

LLANYDLOES, a market-town in the hundred of the ſame name, and county of Montgomery, North Wales, is pleaſantly ſituated near the bank of the river Severn, 13 miles from Newtown, and 180 from London. Several of the ſtreets are ſpacious, but the buildings are irregular, and chiefly of lath and plaſter. The church is a neat edifice, being ſupported by ſix arches, the pillars of which have capitals of palm-leaves, and are ſaid to have been brought from Cwmber Abbey. About the town are ſeveral very extenſive ſheep-walks; and a number of perſons are conſtantly employed in the neighbouring ſlate quarries. The pariſh conſiſts of the townſhips of Brithdir, Cil-Machen, Glynn-Hafren-Is-Coed, Manleodd, Morfodion, Treffin, and Yſtrad Dunod. The petty ſeſſions for the hundred are holden here. Llanydloes was formerly a contributory borough to Montgomery, but was diſfranchiſed with Pool and Llan-

Fyllin. The town however has ſtill the nominal appendages of a mayor, and his ſubordinate officers. A conſiderable manufactory of flannels is carried on here. Pennant, Evans, Bingley, and Skrine deſcribe this place and its neighbourhood in their reſpective tours in North Wales.

LLATA, a town of Peru, in the dioceſe of Lima; 90 miles from Lima.

LLAUGHARNE, Llaugharm, *Llacharn*, or *Laugharne*, a market-town, ſea-port, and pariſh, in the hundred of Derlis, Caermarthenſhire, Wales. The town is ſituated at the mouth of the river Coran, and is one of the moſt ſequeſtered towns in the principality. The church is a large handſome building, in very excellent condition. Towards the ſouth end of the town, and cloſe upon the bay of Caermarthen, ſtand the ruins of an old caſtle, which is ſaid to have been erected, or at leaſt re-built, by Guido de Brian, in the reign of Henry III. The remains of the gateway, which is covered with a profuſion of ivy, and various other parts of it, are ſtill in good preſervation. The corporation of Llaugharne conſiſts of a portreve, a recorder, an indefinite number of aldermen, two common attornies, four conſtables, and 76 burgeſſes. The market is held on Friday, and there are two fairs annually, but theſe are very inconſiderable. This was the birth-place of a celebrated political writer and divine, Dr. Joſiah Tucker, who died in 1799.

At a ſhort diſtance from the town are the veſtiges of a ruin, now called Roches caſtle. This building, according to tradition, was formerly a monaſtery, but when it was built, or by what order of monks, is wholly unknown. The pariſh church is ſaid anciently to have ſtood on the farm named Craſeland, *i. e.* Chriſt's land, but no traces of ſuch a building can now be diſcovered. In the year 1801, this town contained 1484 inhabitants.

LLECH, the Welſh name for a kind of monumental ſtone found in that country. See Pillar.

LLENDILAFAYA, a town of Spain, in the province of Aſturia; 8 miles S.W. of Orviedo.

LLERENA, a town of Spain, in the province of Eſtramadura, belonging to the knights of the order of St. Jago, by whom it was founded; 53 miles E. of Cordova. N. lat. 38° 7'. W. long. 5° 59'.—Alſo, a town of Mexico, in the province of Zacatecas; 80 miles N.N.W. of Zacatecas. N. lat. 23° 48'. W. long. 104° 46'.

LLIRIA. See Liria.

LLIVIA, a town of Spain, in Catalonia, in the Pyrenees, near the ſource of the Segre, anciently called "Julia Libyca;" 6 miles N.E. of Puycerda.

LLOBREGAT, a river of Spain, in Catalonia, which runs into the Mediterranean, about 9 miles W. from Barcelona.

LLOMSA, a town of the duchy of Warſaw, on the Narew; 70 miles N.N.E. of Warſaw.

LLORENTE don Bernardo, in *Biography*, a Spaniſh painter, who was in favour at the court of Philip V., and employed to paint the infant Don Felipe. From the proſpect of preferment this circumſtance held forth to him, he was diverted by a decided turn for ſolitude; which made him fly the court, and in the ſequel obtained for him the name of Pintor de las Paſtoras, the painter of ſhepherdeſſes, from the number of madonnas which he painted, arrayed in their garb, and ſurrounded by flocks. He died in 1757, at the age of 72.

LLORET, in *Geography*, a town of Spain, on the S.E. coaſt of Catalonia; 20 miles N.E. of Mataro. N. lat. 43° 42'. E. long. 4° 42'.

LLOWITSCH, a town of the duchy of Warſaw; 24 miles N.W. of Rava.

LLOYD, William, in *Biography*, an Engliſh prelate, was born at Tilehurſt, in Berkſhire, in 1627. His father, rector of his native place, took great pains in the education of his ſon, who repaid his attention by a moſt rapid progreſs in the learned languages. He was not quite twelve years of age when he was entered a ſtudent of Oriel-college, Oxford, whence he removed, in 1640, to a ſcholarſhip in Jeſus-college. He was ordained in 1656, and, after the reſtoration, he obtained, in a very ſhort time, conſiderable preferment in the church, till at length, in 1680, he was promoted to the ſee of St. Aſaph. In 1684, he publiſhed his "Hiſtory of the Government of the Church, as it was in Great Britain and Ireland, when they firſt received the Chriſtian Religion." In 1688, biſhop Lloyd was one of the ſix biſhops who, together with archbiſhop Sancroft, were committed to the Tower for preſenting a petition to king James II., againſt that prince's declaration for ſuſpending the laws in favour of the Papiſts, which the clergy were enjoined to read in the churches. Their triumphant acquittal is well known to our readers. About the cloſe of the ſame year, being known to concur very zealouſly in the revolution, he was made almoner to king William III., and, in 1692, was tranſlated to the ſee of Lichfield and Coventry. In 1699, he publiſhed "A Chronological Account of the Life of Pythagoras, and of other famous Men, his Contemporaries: with an Epiſtle to the Rev. Dr. Bentley, &c." In 1699, he was tranſlated to the biſhopric of Worceſter. Having, ſome time after this, been charged with an improper interference in the county election, he was diſmiſſed from the office of almoner. He died at Hartlebury-caſtle in the year 1717, when he had attained to the ninety-firſt year of his age. According to biſhop Burnet, Dr. Lloyd "was a great critic in the Greek and Latin authors, but chiefly in the ſcriptures. He was an exact hiſtorian, and the moſt punctual in matters of chronology. As much, however, as he was ſet on learning, he had never neglected his paſtoral care. He was a holy, humble, and patient man, ever ready to do good when he ſaw a proper opportunity; even his love of ſtudy did not divert him from that." He was author of a great number of publications, the titles of which are given in the Biographia Britannica: and he left ſeveral pieces behind him in an unfiniſhed ſtate; among theſe was "A Syſtem of Chronology," out of which his chaplain, Mr. Benjamin Marſhal, was ſaid to have compoſed his Chronological Tables. He was ſuppoſed to have had a principal ſhare in the "Series Chronologica Olympiadum, Iſthmiadum, Nemeadum, &c." publiſhed by his ſon at Oxford in 1700. He engaged biſhop Burnet to undertake his "Hiſtory of the Reformation," furniſhed him with a curious collection of facts and obſervations: and he aſſiſted Dr. Wilkins in compoſing his "Eſſay towards a real Character, and a philoſophical Language." Biog. Brit.

Lloyd, Robert, ſon of Dr. Peirſon Lloyd, was one of the uſhers of Weſtminſter-ſchool. We have already, under the article Churchill, refered to this unfortunate young man, who is known chiefly as an author, by a poem, entitled "The Actor," which not only exhibited proofs of great judgment in the ſubject he was treating of, but had alſo the merit of ſmooth verſification and ſtrength of poetry. He was ſome time at the univerſity of Cambridge, where he took the degree of M. A. After he quitted his place as uſher at Weſtminſter-ſchool, he relied entirely on his pen for ſubſiſtence: being of a thoughtleſs and very extravagant diſpoſition, he got deeply into debt, and was in conſequence thrown into the Fleet priſon, where he depended almoſt wholly on the bounty of his friend Churchill, whoſe kindneſs to him continued undiminiſhed during all his neceſſities. On the death of his benefactor, Mr. Lloyd ſunk into a ſtate of deſpondency, which put an end to his exiſtence in 1764. Mr. Wilkes ſays, that "Lloyd was mild and affable in private life, of gentle manners, and very engaging converſation. He was an excellent ſcholar, and an eaſy natural poet. His peculiar excellence was the dreſſing up an old thought in a new, neat, and trim manner. He was contented to ſcamper round the foot of Parnaſſus on his little Welſh poney, which ſeems never to have tired. He left the fury of the winged ſteed, and the daring heights of the ſacred mountain, to the ſublime genius of his friend Churchill." His works were publiſhed in 2 vols. 8vo. in 1774.

LLOYD, NICHOLAS, an Engliſh divine, who was rector of St. Mary Newington, Surrey, where he died in 1680, at the age of 49. He compiled an hiſtorical, geographical, and poetical dictionary, which was printed at Oxford in 1670, in folio, and again in 1695, in 4to.

LLOYD'S *Lake*, in *Geography*, a bay on the S. coaſt of Eaſt Florida. N. lat. 25° 18′. W. long. 80° 50′.

LLUCH MAYER, a town of the iſland of Majorca, ſituated in the middle of a large plain, at the end of which is a mountain ſtanding by itſelf, called La Randa. This town was built in the reign of James II. in the year 1300: the population amounts to about 3500 perſons. The ſtreets and houſes are very regularly built; it has one pariſh church, conſecrated to the archangel St. Michael.

LLULLA *and Chiloas*, a juriſdiction of the dioceſe of Truxillo, in South America, lying S. of Chachapayas, and E. of the Cordillera of the Andes; low, warm, and moiſt, and covered with woods, ſo that a great part of it is uninhabited. It borders on the river of Moyabamba, which, commencing its courſe from theſe ſouthern provinces of Peru, forms the river of the Amazons. The principal commodity of this country is tobacco, which, with a particular kind of almonds called "Andes," and a few other fruits natural to its climate, form the commerce carried on by this province with the others.

LLYN SAVADDAN, or *Savathan Pool*, a lake of South Wales, in Brecknockſhire; 4 miles E. of Brecknock. This lake is larger than any in Wales, except that of Bala, being two miles in length, and, in ſome places, one mile broad. The river Lunwy paſſes through this lake, and finds its way to the Wye, in a direction nearly due north. It is obſerved not to mix its waters with thoſe of the lake in its paſſage; and the ſeparation is underſtood to be ſo complete, that unleſs immediately after heavy ſtorms, the fiſh of the river are not found in the lake, nor thoſe of the lake in the river. The depth of Llynſavaddan is ſaid to be about thirteen fathoms. The ancient tradition of a city being drowned, ſo univerſally applied to ſuch bodies of water, is too trivial to deſerve further notice.

LLYWARCH AP LLYWELYN, in *Biography*, an ancient Welſh bard, who flouriſhed from about 1160 to 1220. Many of his pieces are in the Welſh Archaiology, and contain ſeveral hiſtorical notices of value.

LLYWELYN AP GRUFFYDD, the laſt ſovereign of Wales, who reigned from A.D. 1254, to 1282. He was a brave prince, and reſiſted the ambition of Edward I. king of England a long time, but he at laſt fell, and with him the independence of the Welſh as a diſtinct nation.

LLYWELYN SION, an eminent poet of Glamorgan, who collected the ſyſtem of Bardiſm, which is preſerved. He preſided at ſeveral meetings of the bards, and died in the year 1616.

LLYWELYN, THOMAS, a Welſh nonconformiſt divine of the Baptiſt denomination, was a native of Monmouthſhire, and died in 1796. He publiſhed a hiſtory of the different editions of the Welſh bible.

LO, ST. in *Geography*, a town of France, and principal place of a diſtrict, in the department of the Channel, of which it is the capital, ſeated on the Vére, ſurrounded with walls, and defended by a citadel, which has ſome manufactures of cloth, ſerges, and leather. The place contains 6987, and the canton 11,707 inhabitants, on a territory of 90 kiliometres, in 11 communes. N. lat. 49° 7′. W. long. 1° 1′.

LOACH, in *Ichthyology*, the Engliſh name of a fiſh, called alſo the *groundling*, and by the Germans the *ſmorle* or *ſmorling*. It is a ſpecies of the *Cobitis*. See COBITIS *Barbatula*.

LOAD, or LODE, in *Mining*. See LODE.

LOAD is alſo uſed for nine diſhes of ore, each diſh being about half a hundred weight.

LOAD, *Maſter*, among *Miners*. See MASTER-*load*.

LOAD, *Training a*. See TRAINING.

LOAD *Water-line*, in a *Ship*, is the deepeſt line of floatation, or when all her cargo is taken in.

LOADING. See CARGO and LADING.

LOADMANAGE, in *Maritime Affairs*: the hire is ſometimes ſo called, which the pilot of a ſhip receives of a maſter, for conducting a ſhip up the river, or into port.

LOADSTONE. See MAGNET.

LOADSTONE, *Floating*, an inſtrument invented and ſo called by Mr. Boyle, which he uſed to diſcover whether guineas or other coins were counterfeit, by putting the inſtrument, with the piece of coin to be tried and faſtened to the bottom of it, into a tall glaſs or other veſſel of water: marks being ſo made on the ſlender metalline pipe, which forms the upper part of the inſtrument, that the hollow ball which made the lower part of it, would ſink much lower, at leaſt two inches, if the coin be true gold than if it be not: and according as the water reaches to one or other of the aforeſaid marks, an eſtimate may be made, whether the piece of coin, if counterfeit, be made of tin, braſs, copper, ſilver, or lead. The inſtrument might be applied to any coins, either of gold or ſilver, provided that they were of any conſiderable bulk. Birch's Hiſt. of the Royal Society, vol. iii. p. 115.

LOAM, derived from the German word *leime*, and anciently ſignifying a viſcid earth, in *Natural Hiſtory*, a claſs of compound or mixed earths, compoſed of diſſimilar particles, hard, ſtiff, denſe, harſh, and rough to the touch, not eaſily ductile while moiſt, readily diffuſible in water, and uſually compoſed of ſand and a tough viſcid clay.

Hill comprehends under this claſs two genera. 1. The *thrauſtomicthes*; and, 2. The *gliſchromicthes*. The firſt are compoſed of ſand and a leſs viſcid clay, and are of a friable or crumbly nature; the ſecond are compoſed of ſand and a more viſcid clay, and are of a more tough and viſcid texture.

Da Coſta diſtinguiſhes them by their colour into black and white, which are not acted upon by acids; yellow loams, ſome of which are not acted upon by acids; and other alkaline, brown loams, ſome acted upon by acids, to which claſs belongs the Windſor loam, ſo well known and ſo much uſed for making bricks, building furnaces, lutes, &c. and others alkaline; and the green loams not acted upon by acids.

According to Woodward, loam conſiſts of clay, mixed with fine ſand, or of clay with a ſuperabundance of ſand; and Mr. Bergman, having analyſed ſome loam found in the neighbourhood of London, and conſidered as very excellent, found it to conſiſt of 87 *per cent.* of a reddiſh-grey ſand, as fine as meal, and 13 of argil. Suppoſing, therefore, clay to conſiſt, as it moſt frequently does, of 30 *per cent.* of argil, and 70 of fine ſand, we ſhall find, ſays Kirwan, that loam of the beſt kind contains an exceſs of ſand amounting to 17 *per cent.*; if the exceſs of ſand be greater, it will form what is called a *ſandy loam;* if ſmaller, *clayey loam.* Mr. Bergman found nothing calcareous in the loam; when it contains any, it ſo far inclines to the nature of marle, and this *marlaceous loam* may be either *ſandy* or *clayey*, according as the proportion above indicated is exceeded on either ſide. But loams moſt frequently contain alſo a portion of calx of iron, and this calx is more or leſs oxygenated; a circumſtance which produces a conſiderable variety in the colour, and probably alſo in the vegetative powers of this earth: if its proportion be conſiderable, *viz.* 4 or 5 *per cent.* they often contain alſo ſome proportion of vitriolic acid. The colour of loam frequently proceeds from that of the calces of iron contained in it, but more frequently from its ſandy part. Gravel, which is a coarſer ſort of ſand, either of a calcareous or ſiliceous nature, is often mixed with loams, and alſo pebbles, whence new diſtinctions ariſe of importance to agriculture. Kirwan's Elem. of Mineralogy, vol. i. See Mould and Soil.

Loam is alſo uſed for a ſort of mortar made of this earth, by tempering it with water, ſtraw, &c.

LOAMY Soil, in *Agriculture*, that ſort of ſoil into which loam enters in a conſiderable proportion. Theſe ſoils are diſtinguiſhed by many different names and colours. See Soil.

LOAN-Banks, or *Lending-houſes*, eſtabliſhments which may be traced to an ancient origin, formed and ſupported by humane perſons, with a view of lending money to the poor for a certain period, on pledges, without intereſt. Thus, we are told, the emperor Auguſtus converted into a fund the ſurplus of the money which aroſe to the ſtate from the confiſcated property of criminals, and lent ſums from it, without intereſt, to thoſe who could pledge value equal to double the amount. (Suet. Vit. Auguſti, cap. 41.) Tiberius alſo advanced a large capital, from which thoſe were ſupplied with money for three years, who could give ſecurity in lands equivalent to twice the value. (Suet. Vit. Tiberii, c. 48. Tacit. Annal. vi. 17. Dio Caſſius, c. viii. 21.) Alexander Severus reduced the intereſt of money by lending money at a low rate, and advancing ſums to the poor without intereſt to purchaſe lands, and agreeing to receive payment from the produce of them. (Æl. Lamprid. Vit. Alex. Severi, cap. 21.) Theſe examples of the ancients were followed in modern Italy. In order to collect money, the popes conferred upon thoſe who would contribute towards that object many fictitious advantages, which at any rate coſt them nothing. At firſt, money was lent to the poor for a certain time without intereſt, provided they could depoſit pledges of proper value. At length the pontiffs reſolved to allow the lending-houſes to receive intereſt, not for the whole capitals which they lent, but only for a part, merely that they might raiſe as much money as might be ſufficient to defray their expences. In proceſs of time, it was thought proper, for the purpoſe of their having ſufficient ſtock in hand, to give to thoſe who ſhould advance them money a moderate intereſt, which was prudently concealed by blending it with the unavoidable expences of the eſtabliſhment. The lending-houſes, therefore, gave and received intereſt. But in order to avoid the odious name, the intereſt that was received was ſaid to be "pro indemnitate;" and this is the expreſſion made uſe of in the papal bull. The pope declared the holy mountains of piety, as they were called, to be legal; and threatened thoſe with his vengeance who dared to entertain any farther doubts on the ſubject. All the cities now haſtened to eſtabliſh lending-houſes; and their example was at length followed in other countries. The origin of lending-houſes, in the ſtrict ſenſe of the term, is referred to the time of pope Pius II. or Paul II., who filled the papal chair from 1464 to 1471. The greater part of the lending-houſes in Italy was eſtabliſhed in the fifteenth and following centuries by certain Minorites. Notwithſtanding the manifeſt advantages with which lending-houſes were attended, and though many of them had been ſanctioned by the infallible court of Rome, many, but chiefly Dominicans, exclaimed againſt theſe inſtitutions, which they did not call *montes pietatis*, but *impietatis*. As this diſpute was revived with much warmth in the beginning of the 16th century, it was at length terminated by pope Leo X., who, in the council of the Lateran, declared by a particular bull, that lending-houſes were legal and uſeful; that all doubts to the contrary were ſinful; and that thoſe who ſhould write againſt them would be in a ſtate of excommunication. The council of Trent alſo, by a decree, acknowledged their legality, and confirmed them. See Mounts *of Piety*. See alſo Lombards and Bank.

LOANDA, in *Geography*, an iſland in the Atlantic, near the coaſt of Angola, about 12 miles long, and one wide, ſeparated from the continent by a narrow channel, which forms a good harbour. The ſoil does not produce grain; but fruits, ſuch as oranges, figs, &c. are plentiful. It contains ſeven or eight villages, and on the coaſt are found ſhell-fiſh, called "zimbi," uſed for money by the natives, like cowries in India. S. lat. 8° 50′.

Loanda, or *St. Paul de Loanda*, a ſea-port town of Africa, in the kingdom of Angola, the ſee of a biſhop, and capital of a fertile province called Loanda, in poſſeſſion of the Portugueſe; containing ſeveral churches and convents, and about 5000 inhabitants, of whom 1000 are whites, and the reſt blacks or mulattoes. The country abounds in cattle and ſheep; Indian corn, millet, manioc, and fruits. S. lat. 8° 53′. E. long. 13° 22′.

LOANGHILLY, a town of Africa, in Loango; the uſual burying place of the emperor; 10 miles S. of Loango.

LOANGO, a country or kingdom of Africa, ſituated on the W. coaſt towards the Atlantic, and bounded on the N. by Benin, on the E. by Anziko, and on the S. by Congo. Its climate is hotter, but not leſs healthy and pleaſant than that of Congo and Angola, nor is its ſoil leſs fertile. The inhabitants, inſtead of cultivating the land, content themſelves with bread and fiſh, and ſuch fruits, greens, and pulſe, as the ſoil naturally produces. Cocoas, oranges, and lemons are not much cultivated; but ſugar-canes, caſſia, and tobacco, as well as the palm, banana, cotton and pimento trees, grow here plentifully. They have alſo a great variety of roots, herbs, fruits, grain, and other vegetables, of which they make bread, and which they uſe for food. They have few quadrupeds for domeſtic uſe except goats and hogs, but poultry and various ſorts of game are abundant: among the wild beaſts they have the zebra, and a great number of elephants, whoſe teeth they exchange with the Europeans for iron. The natives, who are called Bramas, are tall, ſtout, and well formed, and though formerly cannibals, are of late much improved in their manners. They practiſe circumciſion, are addicted to trade among themſelves, and are friendly and hoſpitable in their mutual intercourſe. They are fond of females and jealous of their wives. Their dreſs conſiſts chiefly of cloth manufactured by themſelves; and they are fond of ornaments about their necks, legs, and wriſts, which they form of beads of coral, ivory, ſhells of a beautiful hue, chains of copper, tin, or iron, obtained from Europe. Polygamy is allowed among them; their rich men having 12 or more wives, and the poor not fewer than three. Of a Supreme Being, their notions are very imperfect and confuſed. Their worſhip is addreſſed to demons, domeſtic and rural; and to theſe they aſcribe great influence. To their monarchs they attribute a kind of ſupernatural and unlimited power. The foreign commerce of the country conſiſts chiefly in ſlaves; and they likewiſe ſell conſiderable quantities of ivory, tin, lead, iron, and copper. The kingdom of Loango, ſeparated from Congo, of which it was formerly a part, is divided into four principal provinces, *viz.* Lovangiri, Louango-Mongo, Kilongo, and Piri. The firſt is fertile and well inhabited; the ſecond, lying N.E. of the former, is ſpacious and productive, particularly of palm-trees, the oil of which they extract in great quantities; and the inhabitants employ themſelves in working a variety of linen and cloth; the third is a maritime province, and is the largeſt and the moſt populous of the four; its plains are extenſive and fertile, and they are ſheltered at a diſtance by ridges of high mountains; the trade of the inhabitants, who are rude and unpoliſhed, conſiſts in elephants' teeth; the laſt province, north of Kilongo and Louango-Mongo, is low and flat, but abounds with variety of fruits and other trees, and is well peopled and cultivated; the inhabitants are peaceable and ſtrangers to war. They have plenty of cattle, and of wild and tame fowl, and take great pleaſure in hunting. Their food is ſupplied by the game they take, and the milk of their cattle. In all theſe provinces there are many towns and villages.

Loango, a city of Africa, and capital of the above-mentioned country, ſituated on a river, which forms a bay at its mouth, about ſix miles from the coaſt of the Atlantic. The natives call it “Borai,” or “Boori.” It is very ſpacious and airy, as the houſes are not contiguous to one another. The ſtreets are wide and clean, and lined with palm-trees, bananas, and bacavas, which ſhelter the houſes both before and behind. The palace adjoins to a ſquare in the centre of the city, and of itſelf forms another ſquare, one and a half mile in compaſs, ſurrounded with a paliſado of ſtately palm-trees. Beſides the public buildings of which it conſiſts, it is occupied by the houſes of the king's women, ten in number, and each capable of accommodating ſeven or eight of them. At a ſmall diſtance is a market place, which ſupplies purchaſers every day with meal, poultry, fiſh, wine, corn and oil, as well as palm-cloth; and in the market-place is a famous temple and mokiſſo, or idol, called “Mokiſſo a Loango,” which has been held in great veneration both by the kings and their ſubjects. The houſes are of an oblong ſhape, flat in the middle part of the roof, and each houſe is fenced round with a hedge of palm-twigs, canes, or bulruſhes.

The bay of Loango, though upon the whole good, is incommoded by a bank on the N. ſide of its entrance, running half a league along the coaſt, and having not more than two and a half fathoms of water. The numerous and large rivers that flow from the continent, occaſion ſuch rapid and ſtrong currents towards the north during almoſt the whole year, that it is very difficult to weather them, and gain a ſouthern courſe. The only months in which they may be ſtemmed with ſafety are January, February, March, and April; during the other months of the year the currents flow ſo ſtrong, that even coaſters muſt keep at leaſt 10 or 12 leagues off the land. S. lat. 4° 40′. E. long. 10° 25′.

Loango, a river of Africa, which runs into the Atlantic, S. lat. 10° 30′.

LOANO, or Lovano, a town of Genoa, near the ſea; ſix miles S.S.W. of Finale.

LOANS, Government. See Stocks.

LOAR, or Loarre, in *Geography*, a town of Spain, in Aragon; 13 miles S. of Jaca.

LOARDEGA, a town of Hindooſtan, in Bahar; 40 miles S. of Palamow.

LOBARIA, in *Natural Hiſtory*, a genus of the Vermes molluſca claſs and order: Body lobate, convex above, flat below. There is only one ſpecies, *viz.* quadriloba, characterized as having a tail with four lobes. It is found in the northern ſeas.

LOBATUM Folium, in *Botany*, a leaf the outline of whoſe ſegments is curved. See Leaf.

LOBAU, in *Geography*, a town of Pruſſia, in the territory of Culm; 44 miles E. of Culm.

Lobau, or *Liebe*, one of the moſt ancient towns in the province of Upper Luſatia, containing two churches, three chapels, an hoſpital, and a Latin ſchool, and trading chiefly in linen and thread; 10 miles S.W. of Gorlitz. N. lat. 51° 7′. E. long. 14° 46′.

LOBB, Theophilus, in *Biography*, a phyſician of conſiderable reputation about the middle of the laſt century, practiſed his profeſſion in London, and left ſeveral works on medical topics. He died on the 19th of May, 1763, in the eighty-fifth year of his age. The following are the titles of his publications. “Treatiſe of the Small-pox,” London, 1731, 1748, 8vo.; which was tranſlated into French in 1749. “Rational Method of curing Fevers, deduced from the Structure of the Human Body,” ibid. 1734, 8vo.: in this work he adopted the doctrines of Boerhaave. “Medical Practice in curing Fevers,” ibid. 1735, 8vo. “A Practical Treatiſe on painful Diſtempers, with ſome effectual Methods of curing them,” ibid. 1739. “A Treatiſe on Solvents of the Stone, and on curing the Stone and the Gout by Aliments,” ibid. 1739. This work paſſed through ſeveral editions, and was tranſlated into Latin and French. The author conſidered the matter of urinary calculi and of gout as of an alkaline nature, and vegetable acids as the remedy. “Letters concerning the Plague and other contagious Diſtempers,” ibid. 1745. “A Compendium of the Practice of Phyſic,” ibid. 1747. Beſides theſe works, he was the author of ſeveral papers printed in the Gentleman's Magazine, and of one or more tracts on religious ſubjects in the latter part of his life. Eloy Dict. Hiſt. Gent. Mag.

LOBBY, in *Architecture*, is a ſmall hall or waiting-room: it is alſo an entrance into a principal apartment, where there is a conſiderable ſpace between that and a portico or veſtibule, and the length or dimenſions will not allow it to be conſidered as a veſtibule or an anti-room. See Antichamber.

Lobby, in a *Ship*, an apartment cloſe before the captain's cabin.

Lobby, in *Agriculture*, a ſort of narrow confined place, formed either by hedges and trees, or other kinds of fencing, near to the farm-yard, for the purpoſe of confining live-ſtock. It is obſerved by Mr. Marſhall, in his Minutes of Agriculture in the Midland Counties, that “every farmery ought to have a lobby and a croft appending to it, ſerving as a double fence; thereby preventing ſtock from running over, poaching, and injuring the farm; the latter for calves, a ſaddle horſe, and invalids. He found the conveniency of a lobby in Surrey, and the want of one in Norfolk, and in this diſtrict; he can foreſee the uſe of that which he is forming, with a ſcreen of planting; emboſoming the entire farmery, in ſuch a manner as to ſhelter it effectually from the north and eaſt winds."

LOBE, or Lobus, in *Anatomy*, an epithet applied to the more or leſs ſeparate parts, of which the glands of the body are compoſed. Thus we have lobes of the brain, lungs, liver, &c.

Lobe is alſo uſed for the tip of the ear; which is more fat and fleſhy than any other part thereof.

Du Laurent ſays, that the word *lobe*, in this laſt ſenſe, comes from the Greek, λωβεῖν, *to ſhame*, or *be aſhamed*; this part of the ear being ſaid to bluſh when the perſon is aſhamed.

Lobe is alſo uſed in ſpeaking of fruits and grains.

Thus the bean conſiſts of two equal parts, called lobes, which compoſe the body thereof, and are encompaſſed with the other ſkin. And all other grains, even the ſmalleſt, are divided, like the bean, into the two lobes, or equal parts; as Dr. Grew has ſhewn in his Anatomy of Plants. See Lobus.

LOBEDA, in *Geography*, a town of Germany in the principality of Eiſenach; three miles S.S.E. of Jena.

LOBEDIUN, a town of Ruſſia, in the government of Tambov; 100 miles W.N.W. of Tambov. N. lat. 53° 28′. E. long. 38° 50′.

LOBEGUN, a town of Weſtphalia, in the duchy of Magdeburg; 25 miles N. of Leipſic.

LOBEIRA, Vasco, in *Biography*, author of "Amadis of Gaul," was born at Porta about the middle of the fourteenth century. He was knighted upon the field of battle at Aljubarrota by king Joam I. in the year 1386, and died at Elvas, where he poſſeſſed a good eſtate. According to Mr. Southey nothing more has been collected by the Portugueſe biographers of Lobeira. It has been queſtioned whether he was the author of the Amadis de Gaul, and whether that poem was not written in France rather than in Portugal; to which the tranſlator replies, "Some weight muſt be allowed to the authority of the Portugueſe writers, who have all, with the exception of Cardoza, attributed it to Lobeira as an original production." "The romance," he farther adds, "is not older than Lobeira's age; for it refers to the Engliſh claim upon the crown of France, and repreſents Windſor as the moſt ſplendid court, and the king of England as the moſt powerful king in Chriſtendom. It was written in a country remote from England; for Windſor is called an iſland, and the adventurers who croſs from France make Briſtol their port. Many other ſuch inſtances of geographical ignorance could be mentioned; miſtakes which might eaſily be made by a Portugueſe, but not by a Frenchman. It was written in Portugal, for many of the names are Portugueſe. Better proofs of time and place cannot be required." Of the poem Mr. S. ſays; it may be ſafely affirmed that it contains nothing which, in the age in which it was written, would be regarded as impoſſible, ſcarcely any thing that would be thought exaggerated. The actions of Amadis, and the importance of a ſingle chief, would not appear incredible to a people who had then living among them their own hero, Nuno Alvares Pereira, whoſe military exploits were as extraordinary, and as important to his own character. To a nation who knew this man, and knew alſo that it was chiefly owing to his courage that they exiſted as a ſeparate people, the character of Amadis would not appear exaggerated. Amadis has been conſidered as the model of a perfect knight. "Truly," ſays ſir Philip Sidney, "I have known men, that even with reading Amadis de Gaul, which, God knows, wanteth much of a perfect poeſie, have found their hearts moved to the exerciſe of courteſy, liberality, and eſpecially courage."

LOBEL, or L'Obel, Matthias de, a botaniſt nearly contemporary with Cluſius, whoſe wooden cuts, for the moſt part, re-appeared in his works, was not, as ſome have thought, an Engliſhman, but born, in 1538, at Liſle in Flanders, where his father practiſed in the law. He acquired in his youth an ardent love of plants, and had good opportunities of gratifying his taſte, and advancing his knowledge, at Montpellier, where he ſtudied phyſic under the learned Rondelet, or Rondeletius. During his reſidence there, he found opportunities of making ſome botanical excurſions over the ſouth of France. At Narbonne he became acquainted with Pena, afterwards his fellow labourer in the *Adverſaria*, the firſt edition of which was publiſhed, in ſmall folio, at London, in 1570, and dedicated to queen Elizabeth. The few cuts diſperſed through this volume are moſtly original, but inferior in ſtyle and accuracy, as well as in ſize, to thoſe of Cluſius. Before the publication of the *Adverſaria*, our author had extended his travels to Switzerland, the Tyrol, ſome parts of Germany and Italy; had ſettled as a phyſician at Antwerp, afterwards at Delft; and had been appointed phyſician to the illuſtrious William prince of Orange, and to the ſtates of Holland. Dr. Pulteney has not been able to aſcertain the time of Lobel's removal to England, but juſtly concludes it to have been before 1750; indeed, moſt probably, ſome years earlier, as he mentions in this edition of the *Adverſaria*, p. 92, having long ago received from Dr. Turner ſeeds of the Sea Kale, *Crambe maritima*, of which he there exhibits an indifferent cut, mentioning it as a plant whoſe flowery tops might be eaten, though much inferior to the cultivated kinds of the ſame tribe. It appears by this, that the young ſprouts, now known to be ſo excellent for the table, had not then been tried.

The aim of the authors of the *Adverſaria* was to inveſtigate the botany and *materia medica* of the ancients, and eſpecially of Dioſcorides. They therefore frequently criticiſe Matthiolus, the moſt celebrated commentator of the Greek writer, for it is ſcarcely poſſible for different people to purſue this intricate and obſcure path long without diſagreement. Indeed half a ſcore commentators on the plants of Dioſcorides might all exerciſe their ingenuity, in moſt caſes, with equal ſkill, without any body being able to decide which of them was neareſt the truth. The *Adverſaria* was reprinted at Antwerp in 1576, the dedication being, of courſe, there ſuppreſſed. New title-pages had been printed to help the ſale of the original, in 1571 and 1572. Some copies of the Antwerp impreſſion appear to have been made up into a new edition at London in 1605, an ample *Pharmacopeia*, the foundation of which was from Rondeletius, being prefixed, and an appendix to the *Adverſaria* ſubjoined. This volume is dedicated to Edward lord Zouch, whom Lobel had attended, on his embaſſy to Denmark, in 1592, and he calls himſelf, in the title, botaniſt to king James I. Dr. Pulteney obſerves, after Haller, that this work exhibits ſome traces of a natural diſtribution of plants, inſomuch at leaſt as they are thrown together into a number of tribes or orders, according to their habits or flowers; but this is done without any remarks, and with ſo little preciſion, that it can only be ſaid the method of Lobel is better than that of Dodonæus, in which there is no conſiſtent principle at all. His work is much more valuable for the various remarks which it contains, and for the accounts of new plants, diſcovered by himſelf in England or elſewhere. On the ſubject of Britiſh natives indeed, Ray accuſes him of having made ſeveral miſtakes, from having truſted too much to his memory.

The *Stirpium Hiſtoria* of this author, a volume in ſmall folio ſimilar to his *Adverſaria*, was publiſhed at Antwerp in 1576. This is much leſs copious in matter, the pages being moſtly occupied with wooden cuts, which are thoſe of Cluſius, borrowed for the preſent occaſion by the printer, Plantin. An impreſſion of theſe cuts, of an oblong ſhape, was ſtruck off, with names only, in 1581, and another in 1591. Linnæus poſſeſſed both. This publication is in very general uſe, and well known by the title of Lobel's *Icones*. It is, when complete, accompanied by an index in ſeven languages.

Lobel ſeems to have had a very large work in contemplation, which he intended to call *Stirpium Illuſtrationes*. This he did not live to complete. A fragment of it was publiſhed in quarto, without plates, by Dr. W. How, in 1655, making 170 pages, beſides a cauſtic preface of the author, aimed chiefly at Gerarde, whom he doubtleſs comprehends among the "*ſordidi pharmacarii*," charged with robbing the moſt experienced phyſicians of their honours. The body of the work is interſperſed with notes of Dr. How's againſt Parkinſon, who is ſaid to have made diſhoneſt uſe, in his *Theatrum Botanicum*, of ſome papers of Lobel, that fell into his hands. It muſt be allowed that ſuch authors are juſtly cenſured for tranſlating and interweaving deſcriptions, remarks, and places of growth, from foreign works, which apply to the plants of other countries. This fault is not diſſimilar from what we have cenſured in a more modern writer; ſee LIGHTFOOT, and the botanical article FLORA. But the ſtyle of Lobel's preface is properly reprobated by Dr. Pulteney, who blames him for this groſs abuſe of Gerarde after his death, though he had formerly on every occaſion extolled him. The botanical contents of this fragment are, however, very honourable to Lobel, for the number of new plants therein mentioned.

Our author laboured to an advanced age in the purſuit of his favourite ſtudy, and procured from his correſpondents abroad, many new plants for the gardens of his friends. He had the ſuperintendance of a garden at Hackney, cultivated at the expence of lord Zouch; and appears to have reſided, in the decline of life, at Highgate, where he had a daughter, married to a Mr. James Coel. His wife is recorded as having aſſiſted him in his botanical reſearches. He died in 1616, aged 78. Lobel's works. Haller's Bibl. Bot. Pulteney's Sketches.

LOBEL, a ſtrolling, blind, fiddling, Bohemian Jew, the firſt maſter, on the violin, of the celebrated Benda, firſt violin to Frederic II. king of Pruſſia, during the whole reign of that muſical prince. See BENDA, and Burney's German Tour, vol. ii.

LOBELIA, in *Botany*, ſo called in honour of Matthias de Lobel; ſee that article. The plant to which Plumier originally applied the name, is now the *Scævola* of Linnæus. When the latter, at the ſuggeſtion of Jacquin, diſcovered that he and other botaniſts had confounded, under this original *Lobelia*, a vaſt number of ſpecies generically diſtinct from it, but which were then become much better known than itſelf by the name in queſtion, he judged it much leſs inconvenient to keep this name for them, and to give the genus of Plumier a new one. It is hoped the ſame meaſure would be adopted, ſhould any botaniſt aſcertain the original *Magnolia* of Plumier, to be really diſtinct in generic characters from all the other ſpecies ſo called, of which there is ſaid to be ſome ſuſpicion.—Linn. Gen. 456. Schreb. 596. Willd. Sp. Pl. v. 1. 937. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 242. Ait. Hort. Kew. ed. 2. v. 1. 356. Juſſ. 165. Lamarck Illuſtr. t. 724. (Rapuntium; Tourn. t. 51. Gærtn. t. 30.)—Claſs and order, *Pentandria Monogynia*. (Syngeneſia Monogamia; Linn.) Nat. Ord. *Campanaceæ*, Linn. Juſſ.

Gen. Ch. *Cal.* Perianth of one leaf, ſurrounding the germen, in five deep, nearly equal, withering ſegments; the two ſuperior ones moſt directed upwards. *Cor.* of one petal, irregular, ſlightly ringent; tube cylindrical, longer than the calyx, divided lengthwiſe at the upper ſide; limb in five deep lanceolate ſegments, of which the two uppermoſt are ſmalleſt, moſt reflexed, and moſt deeply ſeparated, conſtituting the upper lip; the three lowermoſt more ſpreading, and generally largeſt. *Stam.* Filaments five, awl-ſhaped, the length of the tube of the corolla, united upwards; anthers united into an oblong, ſomewhat oblique and curved, cylinder, ſeparating into five parts at the baſe. *Piſt.* Germen more than half inferior, pointed; ſtyle cylindrical, the length of the ſtamens; ſtigma obtuſe, hiſpid. *Peric.* Capſule ovate, or roundiſh, of two or three cells, and two or three valves, burſting at the top, encompaſſed by the calyx; the partitions contrary to the valves. *Seeds* numerous, minute, ſmooth. *Receptacle* conical.

Eſſ. Ch. Calyx in five ſegments, crowning the germen. Corolla of one petal, irregular. Anthers cohering, incurved. Capſule half inferior, of two or three cells.

So much uncertainty attends the characters of ſome plants which have been referred to *Lobelia*, that we can hardly gueſs with any degree of correctneſs at the number of ſpecies. The 14th edition of the *Syſtema Vegetabilium* exhibits the lateſt view that Linnæus or his ſon took of the genus, and there 42 ſpecies are enumerated, of which however the 21ſt, *lævigata*, and 25th, *ſurinamenſis*, are one and the ſame, and *tenella*, No. 40, which is *parvifolia* (not *parviflora*) of Bergius, is *Lightfootia oxycoccoides*; ſee LIGHTFOOTIA. Three others, *Phyteuma*, *bulboſa*, and *volubilis*, go along with *Cyphia*, *cardamines*, and *inciſa*, of Thunberg's Prod. 39, to form the genus CYPHIA, Berg. Cap. 173. Willd. Sp. Pl. v. 1. 952. Ait. Hort. Kew. ed. 2. v. 1. 362, of which we have ſpoken in its place, and which perhaps, when we conſider its having five diſtinct petals, with linear and ſtraight, as well as ſeparate, anthers, may be allowed to conſtitute a tolerably good, though not a very natural, genus. Willdenow, retaining this genus, has ſtill 48 *Lobeliæ*, diſpoſed in three, not very correct, ſections, of each of which we ſhall mention a few examples. Two ſpecies only are natives of Britain.

Sect. 1. *Leaves entire.*

L. *Dortmanna*. Water Lobelia. Linn. Sp. Pl. 1318. Engl. Bot. t. 140. Fl. Dan. t. 39. (Dortmanna lacuſtris, floribus ſparſis pendulis; Rudb. Act. Upſ. for 1720. 97. f. 2. Gladiolus lacuſtris; Ger. em. 105.)—Leaves linear, entire, of two parallel cells. Stem nearly naked.—Found in the clear ſhallow parts of lakes, in the colder parts of Europe, growing in the pure gravelly bottom, and raiſing the flowering part of its ſtem only above the ſurface. The *root* is perennial, compoſed of numerous, long, white, ſimple fibres. *Herb* ſmooth, milky when wounded. Radical *leaves* numerous, entirely immerſed, linear, recurved, nearly cylindrical, though flattiſh on the upper ſide, obtuſe, two or three inches long, very remarkable for conſiſting internally of two cavities, ſeparated by a longitudinal partition. *Stem* ſolitary, erect, round, hollow, almoſt leafleſs, bearing a looſe cluſter of pendulous blue *flowers* in July and Auguſt, often overflowed by ſudden floods. Cluſius received this plant from a Mr. Dortmann, and has repreſented it in his *Curæ Poſteriores*, 40; but the cut, reprinted in Johnſon's edition of Gerarde, is juſtly criticiſed by Rudbeck; for the germen is repreſented ſuperior, the ſtamens totally erroneouſly, and the corolla by no means well.

Sect. 2. *Stem erect. Leaves cut or ſerrated.*

L. *Tupa.* Willow-leaved Lobelia. Linn. Sp. Pl. 1318. (Rapuntium ſpicatum, foliis acutis, vulgò *Tupa;* Feuill. It. v. 2. 739. t. 29.)—Leaves decurrent, lanceolate, finely ſerrated. Cluſter ſpiked. Stem hollow. Feuillée gathered this plant on the mountains of Chili, in 37 degrees ſouth latitude; (not 65, as in Bot. Mag. 1325.) He ſpeaks of it as one of the moſt active of poiſons, the ſmell of the flowers cauſing ſevere vomitings, and the milk of the plant, if by any accident it touches the eyes, occaſioning blindneſs. The *root* is a foot and a half long, apparently perennial. *Stem* as tall as a man, hollow, five-ſided, terminating in a ſpike of large, blood-red, ſtalked flowers, with a lanceolate *bractea* at the baſe of each partial ſtalk. *Leaves* decurrent for the ſpace of 2½ inches, the reſt of their length, about ſeven inches, elliptic-lanceolate, acute, finely ſerrated, minutely downy; reticulated with veins beneath. Feuillée deſcribes the ſerratures, but does not figure them.

L. *gigantea.* Gigantic Lobelia. Sims in Curt. Mag. t. 1325. (L. Tupa; Dryand. in Ait. Hort. Kew. ed. 2. v. 1. 357.)—Leaves ſeſſile, lanceolate, finely ſerrated. Flowers axillary, ſolitary, ſtalked. Stem ſhrubby, ſolid.—Our ſpecimen of this plant was gathered by Mr. Menzies near Valparayſo in Chili, in latitude 33½ ſouth, whence Dr. Brandt is ſaid alſo to have brought ſeeds to Meſſrs. Lee and Kennedy, in whoſe conſervatory the ſhrubby *ſtem* is 15 or 16 feet high, ſolid, and round. *Leaves* ſeſſile, lanceolate, more or leſs ſerrated, ſcarcely reticulated beneath. *Flowers* dull orange, on ſimple, ſolitary, axillary ſtalks, much ſhorter than the leaves. Theſe characters have, in our opinion, juſtified Dr. Sims in making it diſtinct from the laſt, to which it ſeems moreover inferior in virulence.

L. *aſſurgens.* Purple Jamaica Lobelia. Linn. Sp. Pl. 1321. Andr. Repoſ. t. 553.—Leaves elliptic-lanceolate, tapering at both ends, ſharply toothed, ſomewhat decurrent. Cluſter compound, terminal, downy.—Native of Jamaica. It flowers in the latter part of ſummer in our ſtoves, making a handſome appearance, though its purpliſh colour is leſs ſtriking than the ſcarlet of the following.

L. *cardinalis.* Scarlet Lobelia. Linn. Sp. Pl. 1320. Curt. Mag. t. 320.—Leaves broadly-lanceolate, ſerrated. Spike terminal; the flowers turned one way.—Native of North America. Hardy in our gardens, in a ſtrong moiſt ſoil, flowering in Auguſt and September. The *root* is perennial. *Stems* three feet high, leafy. *Flowers* of a moiſt rich and vivid ſcarlet.

L. *urens.* Acrid Lobelia. Linn. Sp. Pl. 1321. Curt. Lond. faſc. 6. t. 63. Engl. Bot. t. 953.—Stem nearly erect. Lower leaves obovate, finely toothed; upper lanceolate, ſerrated. Flowers racemoſe.—Native of France, Spain, and ſome few parts of Devonſhire, on gravelly buſhy commons. This is perennial, flowering in Auguſt and September. Its habit is ſlender, delicate, and ſmooth. *Stem* 18 to 24 inches high, milky. *Leaves* ſcattered. *Flowers* ſmall, blue, numerous, in long weak cluſters. Segments of the *calyx* briſtle-ſhaped, rough, as long as the tube of the flower.

Sect. 3. *Stem moſtly decumbent. Leaves ſomewhat cut.*

L. *Laurentia.* Italian Annual Lobelia. Linn. Sp. Pl. 1321. (Laurentia annua minima, flore cæruleo; Mich. Gen. 18. t. 14.)—Stem proſtrate, branched. Leaves lanceolate-oval, crenate. Stalks ſolitary, axillary, ſingle-flowered, very long.—Native of Italy. A little delicate annual ſpecies, ſent to Kew in 1778, by M. Thouin. It bloſſomed in the green-houſe in July. The *flowers* are blue, very minute.

L. *ſetacea.* Briſtle-ſtalked Lobelia. Sm. Prodr. Fl. Græc. Sibth. v. 1. 145. Fl. Græc. ined. t. 221. (L. tenella; Bivon. Cent. 1. 53. t. 2.)—Radical leaves ſpatulate, wavy; thoſe of the ſtem briſtle-ſhaped. Stems perfectly ſimple, ſingle-flowered, erect.—Native of boggy places in Crete, Cyprus, and Sicily. *Root* annual. *Leaves* ſpatulate, on long ſlender radical ſtalks, obtuſe, wavy, ſmooth, ſomewhat like thoſe of a daiſy. The little ſlender *ſtems* bear two ſmall briſtle-like leaves, and one elegant blue flower. The ſtems appear to be erect, but on account of the cloſe affinity of the preſent ſpecies to *L. Laurentia,* they cannot be disjoined. They are indeed confounded by Willdenow, and by Boccone in his t. 27, where both are well drawn, as one ſpecies. Our *ſetacea* is Rapuntium creticum minimum, bellidis folio, flore maculato; Tourn. Cor. 9.

L. *lutea.* Yellow Lobelia. Linn. Sp. Pl. 1322. Curt. Mag. t. 1319.—Stems aſcending. Leaves lanceolate, ſerrated. Flowers reverſed, in ſhort ſpikes.—Native of the Cape of Good Hope. It flowers here in the green-houſe, and is remarkable for its golden *flowers,* whoſe poſition, as Dr. Sims obſerves, is reverſed, their tube very ſhort, and the poſture of their two ſmaller ſegments, arched over the ſtamens, very peculiar.

Numerous new ſpecies of *Lobelia* are to be added to Willdenow's liſt, from the diſcoveries in New Holland. Theſe are uſually of a ſmooth delicate habit. See Labillardiere, t. 71—74, and Brown's *Prodromus,* v. 1. 562. The latter defines 20 ſpecies from that country, none of them in Willdenow.

Lobelia, in *Gardening,* comprehends plants of the herbaceous and under-ſhrubby perennial kind, of which the ſpecies uſually cultivated are the ſcarlet lobelia, or cardinal's flower (L. cardinalis;) the blue lobelia, or cardinal's flower (L. ſiphilitica;) the long-flowered lobelia (L. longiflora;) the pine-leaved lobelia (L. pinifolia;) and the bladder-podded lobelia (L. inflata.)

Method of Culture.—The firſt and ſecond kinds may be increaſed by ſeed, cuttings of their ſtalks, and parting the roots. The ſeeds ſhould be ſown in autumn, or early in ſpring, in a warm border, or in pots or boxes, ſo as to be moved to different ſituations in different ſeaſons, to have ſhelter from froſt, and ſhade from the mid-day ſun in ſummer. Thoſe ſown in autumn generally come up more freely the following ſpring than thoſe which are ſown in that ſeaſon. They ſhould have ſhelter in hard froſts, either under a frame or awning of mats, but be fully expoſed in mild weather, giving occaſional waterings in the ſpring and ſummer. When the plants have attained two or three inches growth, they ſhould he pricked out in ſeparate ſmall pots of rich earth, giving water, and placing them in the ſhade till freſh rooted, repeating the waterings occaſionally in hot dry weather, and ſhifting them into larger pots as they may require; in winter moving them into a frame to have occaſional ſhelter from inclement weather; and in the ſpring following ſome of them may be turned out into the full ground about March, when they will flower the enſuing ſummer. Some ſhould alſo be retained in pots to be moved under ſhelter in winter, as a reſerve in caſe thoſe in the open air ſhould be killed by the froſt.

And as the plants generally flower in the greateſt perfection the firſt and ſecond year of their blowing, it is proper to raiſe a new ſupply of them every year or two in order to have them flower in the utmoſt perfection every year.

Where the ſecond mode is in uſe, the cuttings of the young ſtalks ſhould be divided into lengths of five or ſix inches, and be planted in an eaſterly border, two parts deep, being covered down with hand-glaſſes, and watered occaſionally. They moſtly emit roots, and form young plants in a month or ſix weeks, when the glaſſes ſhould be taken away, and the plants managed as the others.

And theſe hardy ſorts ſometimes afford off-ſets from their ſides at bottom, which may be ſeparated in autumn, and potted for young plants, being managed as the ſeedlings.

Each of the three laſt ſorts may alſo be raiſed by ſeeds procured from abroad, which ſhould be ſown in pots of light ſandy earth in the autumn, and plunged in the bark-bed; and when the plants are three inches high, planted in ſeparate pots, being replunged in the bark-bed, giving water and occaſional ſhade till they are freſh rooted. They muſt remain conſtantly in the hot-houſe, and have frequent moderate waterings given them.

The firſt two ſorts have a fine appearance in the borders and clumps of pleaſure-grounds, where they will ſucceed when protected in winter from froſts and other injuries.

And all the tender ſorts afford a fine variety in hot-houſe collections.

Lobelia *Siphilitica*, *Blue Lobelia*, or *Cardinal Flower*, in the *Materia Medica*, is a native of Virginia, and flowers from Auguſt till October. Every part of the plant abounds with a milky juice, and has a rank ſmell. The root, which is the part preſcribed for medicinal uſe, in taſte reſembles tobacco, and is apt to excite vomiting. It derived the appellation of *ſiphilitica* from its efficacy in the cure of ſyphilis, according to the experience of the North American Indians, who conſidered it as a ſpecific in that diſeaſe, and who long kept it a ſecret. But the ſecret was purchaſed by ſir William Johnſon, and has been ſince publiſhed by different authors. The method of employing this medicine is ſtated as follows: a decoction is made of a handful of the roots in three meaſures of water. Of this half a meaſure is taken in the morning faſting, and repeated in the evening; and the doſe is gradually increaſed till its purgative effects become too violent, when the decoction is to be intermitted for a day or two, and then renewed till a perfect cure is effected. During the uſe of this medicine, a proper regimen is to be enjoined, and the ulcers are alſo to be frequently waſhed with the decoction, or if deep and foul, to be ſprinkled with the powder of the inner bark of the New Jerſey tea-tree (Ceanothus Americanus.) Although the plant thus uſed is ſaid to cure the diſeaſe in a very ſhort time, yet the antiſyphilitic powers of the lobelia have not been confirmed by any inſtances of European practice. Woodv. Med. Bot.

LOBENSTEIN, in *Geography*, a town of Saxony, and chief place of a lordſhip, on the Lemnitz, in the county of Reuſſen; 26 miles N. of Bayreuth. N. lat. 50° 21′. E. long. 11° 50′.

LOBERA, a town of Spain, in Aragon; 20 miles W.S.W. of Jaca.

LOBES, a town of Bohemia, in the circle of Boleſlaw; 9 miles W.N.W. of Jung-Buntzel.—Alſo, one of the ſmaller Canary iſlands, between Lancerotta and Fortaventura. N. lat. 28° 50′. W. long. 13° 40′.

Lobes *of the Ear, Boring of.* To bore or perforate the lobes of the ears, you muſt firſt of all mark the place with a ſpot of ink. About the middle is generally the beſt ſituation for the aperture. The lobe of the ear is to be extended with the left fore-finger and thumb, and the perforation made exactly where the dot is, with a large common ſewing needle. The ring being now introduced, and gently moved about a few times every day until the margin of the puncture is healed, will hinder the little hole from becoming impervious. See Heiſter's Surgery, vol. ii. p. 5.

LOBINEAU, Guy-Alexis, in *Biography*, was born at Rennes in 1666, entered among the Benedictines of St. Maur in his ſeventeenth year, and devoted his life and talents to ſtudy. He died in the year 1727. His principal works are "L'Hiſtoire de Bretagne," two vols. folio, to which he gave the finiſhing hand, it having been compoſed by Father le Gallois: "L'Hiſtoire de Deux Conquètes d'Eſpagne par les Maures," which is a tranſlation from the Spaniſh, and is probably little more than a romance. "Hiſtoire de Paris," 5 vols. folio: this work was begun and much advanced by father Felibien, and put into the hands of Lobineau to finiſh. "L'Hiſtoire des Saints de Bretagne." He tranſlated the "Stratagems of Polyænus" from the Greek, and made verſions of ſome of Ariſtophanes' comedies. Moreri.

LOBITH, in *Geography*, a town of the duchy of Cleves; 5 miles N.W. of Emmerick.

LOBKOWITZ, Prince, in *Biography*, deſerves well to be remembered among illuſtrious dilettanti in muſic. He was in England at the ſame time as the myſterious count St. Germaine, from 1746 to 1748; and from congenial taſtes in muſic, they were ſeldom aſunder. This prince, who was uncle to the charming and accompliſhed madame Thune at Vienna, was no leſs remarkable for his muſical talents, than the beauty and dignity of his perſon. We have ſeen and heard at Vienna many of his muſical compoſitions, chiefly for the German flute, which, from their correctneſs, would not have diſgraced an eminent profeſſor. The termination of this gallant prince's career was melancholy; after diſtinguiſhing himſelf in the army, as well as by his accompliſhments and good taſte in the fine arts, he loſt his faculties; and was ſeized with a dark and gloomy deſpondency, in which he lingered during the remainder of his miſerable exiſtence.

Lobkowitz, Boleslas de Hassenstein, *Baron de*, a Bohemian nobleman and man of letters. After travelling into various countries, and bearing arms with reputation, he embraced the eccleſiaſtical ſtate, and was employed in public affairs. He died in 1510. His poems were firſt printed at Prague in 1563, and again in 1570. Moreri.

LOBLOLLO Bay, in *Geography*, a bay of the iſland of Antigua, on the W. coaſt.

LOBLOLLY-Bay, in *Botany*. See Gordonia.

Loblolly, a ſea-faring diſh, otherwiſe called *burgoo*.

LOBLOSOW, in *Geography*, a town of Poland, in Red Ruſſia; 36 miles S.E. of Halicz.

LOBO, Jerome, in *Biography*, a Jeſuit miſſionary, born at Liſbon in 1593, entered among the Jeſuits in his ſixteenth year, and in 1622 he went out as one of their miſſionaries to the Eaſt Indies. After paſſing ſome time at Goa, he ſailed to the coaſt of Africa, and penetrated into Abyſſinia, where he reſided ſome years, ſubject to much danger and many hardſhips and ſufferings: on his return he was ſhipwrecked and narrowly eſcaped deſtruction. He promoted the intereſt of the Abyſſinian miſſion at Madrid and Rome, and, notwithſtanding the calamities to which he had been ſubjected, he took a ſecond voyage to the Indies. He returned to Liſbon in 1658, and was made rector of the college of Coimbra, where he died in 1678, at the age of 84. He was author of "An Hiſtorical Account of Abyſſinia," containing much curious and valuable information. It was tranſlated from the Portugueſe language into the French by the Abbè le Grand, with additions, which tranſlation was abridged by Dr. Samuel Johnſon. Moreri.

Lobo, Rodriquez Francis, a Portugueſe poet, was born at Eſtramadura. He was author of a comedy called "Euphroſyne," which is a great favourite among his countrymen. He was likewiſe the author of a folio volume of poems printed in 1721. Moreri.

Lobo, in *Geography*, a town on the S. coaſt of the iſland of Luçon. N. lat. 13° 40′. E. long. 121° 10′.

LOBON, a town of Spain, in the province of Eſtramadura; 13 miles W. of Merida.

LOBOS, a ſmall iſland in the Atlantic, near the coaſt of Africa. N. lat. 21° 20′.—Alſo, a ſmall iſland at the mouth of La Plata river; 15 miles S.W. of Cape St. Maria. N. lat. 35°.—Alſo, a ſmall iſland in the gulf of Mexico, on the coaſt of Guaſteca. N. lat. 22° 28′.—Alſo, iſlands in the Pacific ocean, near the coaſt of Peru, ſurrounded with rocks; about twelve miles from each other, in S. lat. 6° 25′ and 6° 45′. They are alſo called "Sea-Wolves," or "Seals' iſlands."—Alſo, a cluſter of ſmall iſlands in the South Pacific ocean, near the coaſt of Chili. S. lat. 52° 20′.

Lobos *Key*, or *Seal Key*, a ſmall iſland among the Bahamas. N. lat. 22° 45′. W. long. 77° 44′.

LOBRES, a town of Spain, in the province of Grenada; 7 miles N. of Motril.

LOBS, in *Mining*, are ſteps that aſcend or deſcend within the mines, as ſtairs up to and down from a chamber.

LOBSKOI, Pelanskoi, in *Geography*, a town of Ruſſia, in the government of Olonetz, near the lake Sig; 52 miles W.N.W. of Povenetz.

LOBSTADT, a town of Saxony, in the circle of Leipzig; 10 miles S.S.E. of Leipzig.

LOBSTER, in *Zoology*, a ſpecies of the ſquilla, according to ſome writers; but in the Linnæan ſyſtem a ſpecies of the cancer. See Cancer *Gammarus*.

LOBULUS, in *Anatomy*, a diminutive from *lobus*, is a ſmall lobe, and denotes more minute diviſions of glandular bodies, than thoſe which form lobes: as, for example, the lobuli of the lungs. Lobulus auris is that part of the external ear which is pierced for ear-rings. (See Ear and Lobes.) Lobulus Spigelii is a ſmall portion of the liver. See Liver.

Lobulus, in *Botany*, a little lobe, a term ſuggeſted by Dr. Smith, for what has uſually, but erroneouſly, been called the auricle, in ſome ſpecies of *Jungermannia*; ſee that article.

LOBURG, in *Geography*, a town in the duchy of Magdeburg; 22 miles E. of Magdeburg.

LOBUS, in *Botany*, a lobe, a principal diviſion of a leaf, the margins of which are in ſome degree rounded. The term is alſo uſed for the diviſions of the petals, or any other ſuitable part. A capſule is ſometimes ſaid to be lobed, there being ſcarcely any other way of deſcribing, in Engliſh, a tricoccous or tetracoccous fruit.

LOCAGNANO, in *Geography*, a town of the iſland of Corſica; 12 miles N. of Baſtia.

LOCAL, ſomething ſuppoſed to be tied or annexed to ſome particular place.

Thus, in *Law*, a thing is ſaid to be local, *i. e.* annexed or fixed to the freehold. An action of treſpaſs for battery, &c. is tranſitory, not local; that is, it is not neceſſary, that the place where battery was committed ſhould be ſet down as material in the declaration; or if it be ſet down, the defendant cannot traverſe it, by ſaying, he did not commit the battery in the place mentioned in the declaration, and ſo avoid the action.

Local, *Choſe*. See Chose.

Local *Colour*, a technical term in the art of *Painting*, wherein, however, it has two meanings. The one is the actual colour of an object intended for imitation; the other alludes to that colour in conjunction with the ſituation the object which poſſeſſes it fills in a picture; wherein it muſt be more or leſs ſubject to ſhadows, and the regulations of aerial perſpective: which latter diminiſhes the force of colours according to their diſtance from the eye, by the intervention of that of the atmoſphere.

It is a difficult but a neceſſary part of the art to maintain local colours in objects and yet throw them into ſhade, and ſtill more to ſupport it in the gradations from light to dark. A degree of cool colour intervenes in nature, the admixture of which in the ſubſtances uſed in painting too often deſtroys the local or real colour, ſo that painters have often had recourſe to their ſhadow-colour alone, and by mixing that with the poſitive colour, truſt to its effect for harmony, and omit the greater delicacies of nature. But Titian, Vandyke, Correggio, and ſir J. Reynolds, ventured to attempt the full ſupport of the colour of the body, and ſucceeded, particularly the two latter, whom the artiſt will do well to ſtudy on this head.

Local *Cuſtoms*, are thoſe peculiar to ſome lordſhip, or other diſtrict, and not agreeable to the general cuſtoms of the country. See Custom.

Local, or *Artificial Memory*. See Memory.

Local *Motion*. See Motion.

Local *Problem*, in *Mathematics*, is ſuch an one as is capable of an infinite number of different ſolutions; becauſe the point that is to ſolve it, may be indifferently taken within a certain extent; *e. gr.* any where in ſuch a line within ſuch a plane figure, &c. which is called a *geometrical locus*.

A local problem may be either *ſimple*, as when the point ſought is in a right line; *plane*, as when the point ſought is in the circumference of a circle; *ſolid*, as when the point required is in the circumference of a conic ſection; or *ſurſolid*, as when the point is in the perimeter of a line of a *higher kind*, as the geometers call it.

Local *Treſpaſs*, in *Law*. See Trespass.

LOCANA, in *Geography*, a town of France, in the department of the Dora, on the Orco, in a valley, called the "Valley of Locana;" 21 miles S. of Aoſta.

LOCARNO, one of the Italian bailliages of Switzerland, ceded to the Swiſs cantons by Maximilian Sforza, duke of Milan, in the year 1512, and governed by a bailiff whoſe office continues two years; about 15 miles in length and about 12 in breadth. It is ſituated on the N.W. coaſt of the lake Maggiore, is fertile in grain and fruits, and contains 49 pariſhes, and 30,000 inhabitants. By the peace of Luneville it was ceded to the Ciſalpine republic, now the kingdom of Italy.

Locarno, the capital of the bailliage of the ſame name, a ſmall, open, well-built, market town, agreeably ſituated in a fertile plain, near the N.W. border of Locarno, or Maggiore lake, and containing about 1500 inhabitants. Part of the town is built on piazzas in form of a creſcent with two wings; in front is a row of trees and the public walk; the old part of the town is dirty, and the ſtreets narrow. It contains three convents, and a ſmall Franciſcan monaſtery, perched on a rock overhanging the valley, and commanding a ſuperb view of the lake and its magnificent boundaries. The canopy in the church of the Capuchins deſerves mention on account of its beautiful execution; it is of ſtraw-work, and almoſt rivals velvet and gold fringe. Locarno was once ſituated on the lake, and had a port capable of receiving large barks: at preſent it ſtands at the diſtance of a quarter of a mile; a circumſtance which is owing to the accumulation of ſand brought down by the torrent Maggia. The environs of the town abound in wine, fruit, and paſtures. It is now annexed to and included in the department of Verbano. N. lat. 45° 59′. E. long. 8° 35′.

Locarno, *Lake*, or *Lago Maggiore*. See Lake.

LOCATE, a town of Italy, in the department of the Olona; 6 miles S. of Milan.

LOCATELLI, Pietro, in *Biography*, a native of Bergamo, and one of the greateſt performers on the violin in Europe, during the early part of the laſt century; but no leſs remarkable for caprice in his compoſitions, than for execution and a full tone in his performance. He publiſhed twelve grand concertos for violins, and much muſic for other inſtruments, at Amſterdam, where he reſided from 1744 to 1764. Few could play his concertos but himſelf; yet there was "more method in his madneſs," than in that of Vivaldi; ſometimes a ſolidity and good taſte, particularly in his ſlow movements, not inferior to the adagios of Tartini. In 1772, we were very much ſurpriſed to find the blind organiſt and Carilloneur Potholt at Amſterdam poſſeſſed of a taſte ſo delicate and modern in a place where little other muſic was encouraged or liſtened to than "the jingling of bells and of ducats," till that excellent performer told us that Locatelli, the famous player on the violin, who had lived many years in that city, and died in 1764, uſed to give him inſtructions, and to encourage his muſical ſtudies by allowing him the advantage of being always a hearer at his public concerts as well as private performances. This, in ſome meaſure, helped us to account for his taſte and fancy; for Locatelli was poſſeſſed of a great deal of both; and though he delighted in capricious difficulties, which his hand could as eaſily execute as his head conceive; yet he had a fund of knowledge in the principles of harmony, that rendered ſuch wild flights agreeable, as, in leſs ſkilful hands, would have been inſupportable. Foreigners who travelled through Holland, and were curious to hear Locatelli perform, were previouſly appriſed, that the remuneration expected was fixed at two golden ducats for himſelf, and a ſilver ducat to the perſon who accompanied him.

LOCATION, in the *Civil Law*, an act by which any thing is let out, on rent.

The ſecond title of the nineteenth book of the Digeſt is on the ſubject of location and conduction. Location and conduction are relative terms, and are uſed as well for the action of him that lets, as for that of him who takes on that letting.

Location, *Tacit*, is, when the perſon who takes, continues on the premiſes beyond the term of his leaſe; which by the civil law he is allowed to do, at leaſt for the ſpace of a year, on the ſame terms.

LOCCO, in *Geography*, a town of Naples, in Abruzzo Citra, on the Peſcara; 10 miles N. of Sulmona.

LOCH, in the *Materia Medica*, a name given by Avicenna and others to the gum lac. They call it alſo *keikem* and *kenkem*, and are too apt to confound it with the cancanum, ſandarach, and other gums, with which they made their ſeveral ſorts of varniſh.

Loch, or *Lohoch*, in *Pharmacy*, a compoſition of a middle conſiſtence between a ſyrup and a ſoft electuary; chiefly uſed for diſeaſes of the lungs.

The word is originally Arabic; but continues ſtill in uſe among the apothecaries.

The Latins call it *linctus*, and the Greeks εκλειγμα, becauſe the manner of taking it is by licking.

Loch, in *Geography*, a name given in Scotland to a lake and alſo to a bay.

Loch *Alarich*, a lake in the county of Perth; 10 miles S. of George's town:—L. *Alſarrig*, a lake in the county of Inverneſs; 14 miles N.W. of Fort Auguſtus:—L. *Anacat*, a lake in the county of Perth; 11 miles S.E. of George's town:—L. *Anſtronmun*, a lake in the county of Perth; four miles N.W. of George's town:—L. *Archeig*, a lake in the county of Inverneſs, 10 miles long and one broad; 12 miles N. of Fort William:—L. *Aven*, a lake in the S.W. part of Bamffshire; 21 miles S. of Inveraven:—L. *Awe*, a lake in the county of Argyle, 30 miles long, and from a mile to two wide, ſhaded with many ſmall woody iſles, one of which bears the ruins of a monaſtery, and another thoſe of an ancient fortreſs, the reſidence of the Campbells of Lochawe, afterwards dukes of Argyle:—L. *Baa*, a lake on the iſland of Mull, communicating with loch Nagaul to the N.:—L. *Barnera*, a lake or inlet of the ſea, on the N.W. coaſt of the iſland of Lewis; 11 miles W. of Stornaway:—L. *Broom*, a bay on the W. coaſt of Scotland, ſeven miles long and two broad, communicating with L. *More*, its mouth being in N. lat. 57° 56′. W. long. 5° 13′:—*Little L. Broom*, a bay on the W. coaſt of Scotland, eight miles long and one broad; eight miles S.E. of Udrigil Head, N. lat. 57° 52′. W. long. 5° 16′:—L. *Broom*, a town of Scotland, in the county of Roſs, at the S. end of L. Broom lake; 25 miles W.N.W. of Dingwall:—L. *Caſtle Semple*, a lake in the county of Renfrew; ſix miles S.W. of Paiſley:—L. *Catherine*, a lake in the S.W. part of the county of Perth, about ſix miles in length; 20 miles W.S.W. of Crieff:—L. *Dalreach*, a lake in the county of Ayr; 10 miles S.S.E. of Ayr:—L. *Damb*, a lake in the county of Perth; ſeven miles S. of George's town:—L. *Dee*, a lake in the county of Kircudbright; 12 miles N.W. of New Galloway:—L. *Derculoch*, a lake of Perth; ſeven miles S. of Blair Athol:—L. *Dirantadlin*, a lake in the counties of Argyle and Perth; ſeven miles N.W. of George's town:—L. *Doine*, a lake of Perth; 20 miles W.S.W. of Crieff:—L. *Druinard*, a lake on the N.W. ſide of the iſland of Ilay:—L. *Drumelly*, a lake of Perth; ſeven miles N.W. of Coupar:—L. *Duntelchah*, a lake in the county of Inverneſs; 20 miles N.E. of Fort Auguſtus:—L. *Eil*, a lake of Inverneſs, eight miles long and one broad, near Fort William:—L. *Enoch*, a lake in the county of Kircudbright; 14 miles N.W. of New Galloway:—L. *Ericht*, a lake in the county of Inverneſs, 12 miles long and half a mile wide; four miles N. of George's town:—L. *Erriboll*, a capacious and ſafe bay on the N. coaſt of Scotland; three miles W. of Whitenhead, its mouth being in N. lat. 58° 32′. W. long. 4° 29′:—L. *Erſey*, a lake in Arran iſland; five miles N.W. of Brodick:—L. *Eſſan*, a lake of Perth; 18 miles S. of George's town:—L. *Etive*, a bay on the W. coaſt of Scotland, 20 miles long and about one broad; 15 miles N. of Inverary, N. lat. 36° 26′. W. long. 5° 5′:—L. *Fainiſh*, a lake in the N.W. part of the county of Roſs; 16 miles W. of Dingwall:—L. *Fine*, a bay in the county of Argyle, 34 miles long, and from one to four and ſix broad, extending from about ſix miles N.E. of Inverary to the river Clyde; its mouth being in N. lat. 55° 50′. W. long. 5° 8′:—L. *Fintrakin*, a lake in the county of Dumfries; ſeven miles N.W. of Lochmaben:—L. *Fitty*, a lake in the county of Fife; three miles N.N.E. of Dumfermline:—L. *Frenchy*, a lake of Perth; nine miles N. of Crieff:—L. *Garry*, a lake of Perth; nine miles N.E. of George's town:—L. *Garvie*, a lake in the county of Roſs; 10 miles W. of Dingwall:—L. *Goyle*, a lake which branches off to the N.W. from loch Long, N. lat. 56° 8′. W. long. 5°:—L. *Heck*, a lake in the county of Argyle, between loch Long and loch Fine:—L. *Inver*, a lake in the county of Kircudbright; five miles N. of New Galloway:—L. *Kenmoor*, a lake at the union of the Ken and Dee, five miles long and half a mile wide:—L. *Kingsmoor*, a lake in the county of Selkirk; 11 miles S.S.W. of Selkirk:—L. *Laggan*, a lake of Inverneſs, eight miles long and half a mile wide; 10 miles S.E. of Fort Auguſtus:—L. *Lawerſton*, a lake in the county of Kincardine; nine miles N.N.E. of Stonehaven:—L. *Leadmore*, a lake in the county of Roſs; 24 miles W.N.W. of Dornoch:—L. *Lee*, a lake in the county of Angus; 11 miles N.N.W. of Brechin:—L. *Leven*, a bay on the E. coaſt of Scotland, in Inverneſs, 10 miles long and half a mile wide; nine miles S. of Fort William, its mouth being in N. lat. 56° 40'. W. long. 5° 20':—Alſo, a lake of the ſame name, ſituated in the county of Kinroſs. Though inferior to loch Lomond, not only in extent but in beauty of ſcenery, ſtill it muſt be allowed to preſent to the eye a noble expanſe of water, interſperſed with a variety of fruitful and pleaſant iſlands. This lake varies in ſize conſiderably at different ſeaſons. It is bounded on the eaſt by the Lomond-hills, on the ſouth by the hill of Balneartie, and on the weſt by the plain of Kinroſs. The trout of loch Leven are of a large ſize, and bear a ſtrong reſemblance, both in taſte and appearance, to the ſalmon. They are regularly brought to the Edinburgh markets, where they find a ready ſale, being conſidered extremely delicate. The red colour of their fleſh undoubtedly ariſes from their feeding chiefly on a ſmall ſhell fiſh of a very deep tinge, which abounds in the bottom of the loch. A variety of other fiſh are likewiſe caught here. Eels are particularly plentiful. Theſe, in the month of September, generally migrate towards the ſea in great numbers by the channel of the Leven river, which takes its riſe from the lake. It is remarkable that they never proceed in their migration except during the night.

Loch Leven deſerves particular attention on account of the many diſtinguiſhed remains of antiquity which either adorn its iſlands or its banks. The ruins of the caſtle of loch Leven are placed upon an iſland nearly in the centre of the loch. Its original foundation is unknown, for though tradition ſays it was built by Congal, ſon of Dongart, king of the Picts, yet very little credit can be given to this account. The firſt notice taken of it in hiſtory occurs in the year 1334, when it was beſieged by ſir John de Sterling, an Engliſh officer, commanding a party of Scots who had joined the Engliſh army. But what principally renders this caſtle famous in Scottiſh hiſtory, is the confinement here of the unfortunate queen Mary, by the confederate lords to whom ſhe ſurrendered herſelf priſoner, after having parted with Bothwell at Carberry. Being placed in the cuſtody of the wife of Douglas of loch Leven, a woman of rude manners, and an inveterate enemy to the queen, ſhe ſuffered all the miſeries of a rigorous captivity. In this caſtle ſhe remained for ſeveral months almoſt forgotten, till the haughty conduct of the regent having eſtranged the minds of many of the confederates, they reſolved to reſcue her and themſelves from his tyranny and oppreſſion. With this view ſeveral attempts were made to effect her releaſe, but all of them were rendered abortive by the vigilance of her keeper. Love, however, at laſt prevailed over every obſtacle, Mary, conſcious of poſſeſſing thoſe bewitching charms which ſeldom fail in ſecuring a deep intereſt in the breaſt of ambitious youth, reſolved to employ them in captivating the heart of George Douglas, her keeper's brother. She treated him with the moſt marked diſtinction, and even allowed him to entertain the moſt daring hopes. The temptation was too great to be reſiſted. Having engaged ſome accomplices, they contrived to ſecure the keys one evening, when the family were at their devotions, and opening the gates, allowed the queen and her lover to eſcape by a boat which lay ready to receive them. As ſoon as they reached the ſhore the queen was met with the utmoſt joy by lord Seaton and ſir James Hamilton, with whom ſhe immediately fled to Nidrie, in Eaſt Lothian.

On another, and the largeſt iſland in the lake, the priory founded by Brudo, the laſt but one of the Pictiſh kings, formerly ſtood. Its ruins are ſtill viſible. Portmeak-monaſtery was ſituated on the eaſtern bank of the loch; only a few fragments of it remain. To the eaſt are the ruins of the ancient tower or caſtle of Arnot, which was poſſeſſed by a family of that name for upwards of 600 years. Forſyth's Beauties of Scotland:—L. *Leys*, a lake in the county of Kincardine; 11 miles N.W. of Stonehaven:—L. *Lochy*, a lake of Inverneſs, between Fort William and Fort Auguſtus, 10 miles long, and more than one wide, communicating with loch Eil, loch Linnhe, and loch Archeig:—L. *Lomond*, a lake in the county of Argyle, 17 miles long, and from one to four wide, with ſeveral ſmall iſlands on the broadeſt part, which are ſuppoſed to form part of the Grampian chain, that terminates here on the W. communicating with the Clyde, by a river which joins the Clyde at Dumbarton; 24 miles W. of Stirling; its S. extremity being in N. lat. 56° 3'. W. long. 4° 30'. At the time of the earthquake in Liſbon in the year 1755, the waters of this lake were agitated in a ſingular manner (ſee LOMOND):—L. *Loyal*, a lake in the county of Sutherland, five miles long; two miles S. of Tongue:—L. *Luichart*, a lake in the county of Roſs; 11 miles W. of Dingwall:—L. *Lydoch*, a lake of Perth; five miles W. of George's town:—L. *Lyon*, a lake of Perth; 10 miles S.W. of George's town:—L. *Maddy*, a lake of Inverneſs; five miles long, and half a mile wide; 17 miles N.N.W. of Fort Auguſtus:—L. *Mahaake*, a lake of Perth; five miles N.W. of Dumblane:—L. *Monteith*, a lake in the vicinity of L. Lomond, about five miles in circumference, with two woody iſles, one preſenting the ruins of a monaſtery, the other thoſe of a caſtle of the old earls of Monteith:—L. *Merk*, a lake of Perth; ſeven miles N. of Blair Athol:—L. *Mickly*, a lake of Inverneſs; 13 miles N.N.E. of Fort Auguſtus:—L. *Milford*, or *Melfort*, a ſafe road or harbour, on the W. coaſt of Scotland, much frequented by herrings. N. lat. 56° 16'. W. long. 5° 32':—L. *Moan*, a lake in the N.W. part of the county of Kircudbright; 18 miles N.W. of New Galloway:—L. *Mochrum*, a lake in the county of Wigton; ſeven miles W. of Wigton:—L. *Monar*, a lake in the county of Roſs; ſix miles long and half a mile wide:—L. *Moorn*, a lake in the N.W. part of the county of Roſs; nine miles N of Dingwall:—L. *Moy*, a lake of Inverneſs, near a town of the ſame name; nine miles S.E. of Inverneſs:—L. *Naver*, a lake in the N. part of Scotland, 12 miles in circumference; 28 miles N.N.W. of Dornoch:—L. *Nell*, a lake of Argyle; 17 miles N.W. of Inverary:—L. *Neſs*, a lake of Inverneſs; 22 miles long and one broad, between Fort Auguſtus and the Frith of Murray, into which its waters are diſcharged. This lake was affected at the time of the earthquake at Liſbon: on account of its great depth, from 60 to 135 fathoms, it never freezes:—L. *Oich*, a lake of Inverneſs; four miles long, and a quarter of a mile wide, communicating with loch Neſs; four miles S.W. of Fort Auguſtus:—L. *Oochan*, a lake of Inverneſs; nine miles W.N.W. of George's town:—L. *Orr*, a lake in the county of Fife; ſix miles N.E. of Dumfermline:—L. *Orent*, a lake in the county of Caithneſs; ſix miles S. of Thurſo:—L. *Paatoch*, a lake of Inverneſs; 12 miles N. of George's town:—L. *Quich*, a lake of Inverneſs; 16 miles N. of Fort William:—L. *Rannoch*, a lake of Perth; about eight miles long, E. of George's town:—L. *Rutton*, a lake in Kircudbright; four miles S.E. of Dumfries:—L. *Shin*, a lake in the N. part of the county of Sutherland; 12 miles long and 1½ wide; 13 miles W.N.W. of Dornoch:—L. *Skene*, a lake in the county of Aberdeen; five miles S. of Kintore:—L. *Skiach*, a lake of Perth; ſix miles N.W. of Dunkeld:—L. *Tay*, a lake of Perth, which is a grand and beautiful expanſe of water, of ſuch length as rather to reſemble a noble river, abounding with fiſh, and terminating in an iſland, on which are ſeen the ruins of a priory; having in its eaſtern extremity the capital manſion and plantations of the earl of Braidalben; 24 miles N.W. of Perth:—L. *Tollie*, a lake in Argyle; 11 miles N.N.E. of Glenorchy:—L. *Treig*, a lake of Inverneſs; 14 miles E. of Fort William:—L. *Tumel*, a lake of Perth; five miles S. of Blair Athol:—L. *Turret*, a lake of Perth; five miles N.N.W. of Crieff:—L. *Vack*, a lake of Perth; three miles S.S.W. of Blair Athol:—L. *Valican*, a lake of Perth; ſix miles E. of Blair Athol:—L. *Voil*, a lake of Perth; 17 miles W. of Crieff:—L. *Vrine*, a lake in the county of Roſs; ſix miles long, and half a mile wide; 25 miles W.N.W. of Dingwall:—L. *Vrotachan*, a lake in the S.W. part of Aberdeenſhire; ſeven miles S. of Caſtleton of Braemar:—L. *Uſſie*, a lake of Roſs; two miles W. of Dingwall:—L. *Watten*, a lake in Caithneſs; ſeven miles W. of Wick:—L. *Yeben*, a lake on the W. coaſt of Scotland, on the N. ſide of Loch Terridon.

LOCHABER, a diſtrict of Scotland, in the county of Inverneſs; about 40 miles long and 25 broad, of which the chief place is Fort William. This is one of the moſt dreary, mountainous, and barren diſtricts in Scotland, thinly inhabited, with the houſes wretched. The chief produce is black cattle, with very large flocks of ſheep. Here prince Charles erected his ſtandard in 1745, upon his landing from France, with ſeven officers, and arms for 2000 men.

LOCHE, or *Sea*-LOCHE, a name uſed in ſome parts of England for the *muſtela*, called in other places, particularly in Cornwall, the *whiſtle-fiſh*. See GADUS *Muſtela*.

LOCHEM, in *Geography*, a town of Holland, in the department of Guelderland, on the Borkel; 10 miles E. of Zutphen.

LOCHER MOSS, a moraſs of Scotland, in the county of Dumfries; 10 miles long and three broad, which muſt have been formerly a foreſt, on account of the oak trees that are dug up in it; and as canoes and anchors have been alſo found here, it muſt have been once covered with ſea.

LOCHES, a town of France, and principal place of a diſtrict, in the department of the Indre and Loire; 21 miles S.S.E. of Tours. The place contains 4342, and the canton 14,701 inhabitants, on a territory of 385 kiliometres, in 18 communes. The caſtle, ſeated on a rock in this town, was formerly an important fortification. It had four ranges of ſubterraneous paſſages, running over one another, in the uppermoſt of which, Louis Sforza, duke of Milan, was impriſoned for 10 years, and where he died. Its large tower contains two cages or moveable rooms, with ſtrong oak gates, covered with iron; and in one of theſe cardinal Balve, biſhop of Angers, was confined by Lewis XII. At a convent near the town, an edict was paſſed in 1576, in favour of the Proteſtants; but it was ſoon after violated by the queen regent, Catherine de Medicis. N. lat. 47° 7'. E. long. 0° 34'.

LOCHIA, in *Midwifery*, a diſcharge of blood from the uterus of women, occurring after the expulſion of the placenta, and continuing four, five, or more days. See LABOUR, *Natural*.

LOCHIAL FEVERS, a term uſed by medical writers to expreſs ſuch fevers as ariſe from ſuppreſſions or imminutions of the lochial diſcharges in lying-in women, or from any other irregularities during the time of that diſcharge.

LOCHMABEN, in *Geography*, a town and royal borough, ſituated in the county of Dumfries, and diſtrict of Annandale, Scotland. It is ſuppoſed to have derived its name from the number of ſmall lochs in its vicinity. This borough, according to tradition, received its original charter from king Robert Bruce, whoſe paternal eſtate was the lordſhip of Annandale. It is certain at leaſt, that this monarch beſtowed upon it a conſiderable portion of lands from his own property. The oldeſt charter extant is a writ of *novodamus*, by James VI., dated 16th July, 1612; which aſſigns as a reaſon for the renewal, the deſtruction of the town and its records by the Engliſh, during ſome of their inroads. Lochmaben has undoubtedly been formerly of more importance than at preſent. The borough-roods and town commouty are very extenſive, and for the moſt part fenced off at a very trifling annual rent. The government of the town is veſted in a provoſt, three bailies, a dean of guild, a treaſurer, and nine common-council-men. Coarſe linen is the ſtaple production of this place; 60,000 yards being annually manufactured here and in the neighbourhood for the Engliſh market. The coal uſed for fuel is brought chiefly from Cumberland. Annan, Dumfries, Kirkcudbright, Sanquhar, and this town, join in ſending one member to parliament.

The pariſh of Lochmaben extends about ten miles along the banks of the Annan, which poſſeſſes a very valuable ſalmon fiſhery, almoſt contiguous to the town. Several ſmaller ſtreams flow into this river, all of which are abundantly ſupplied with trout. In the largeſt of the lochs, which preſent a truly beautiful ſheet of water, a great variety of fiſh are caught. The fiſhermen aſſert, that there are 15 or 16 different kinds fit for the table. Among theſe is one called the vendiſe, or vendace, ſome ſay from Vendois in France, as being brought thence by one of the Jameſes. This ſtory, however, does not ſeem very probable, as it is found by experience, that this fiſh dies the inſtant it is touched. Beſides, it has in vain been attempted to tranſport it to other lochs in the neighbourhood. The vendiſe is about the ſize of a herring, and reſembles it both in external appearance and anatomical ſtructure. In taſte and flavour it is extremely delicate, ſo that it is reckoned among the moſt delicious fiſh that ſwims. It lies generally in the deepeſt parts of the loch, and is caught with the net.

Upon a peninſula which ſtretches out into this loch ſtands a caſtle, originally built by Robert de Bruce, the firſt of that name who ſwayed the Scottiſh ſceptre. It was a place of great ſtrength previous to the introduction of fire-arms, and could ſtill be made ſo, if its fortifications were raiſed anew according to the principles of modern warfare. The original buildings of the caſtle ſeem to have occupied about an acre of ground. The walls were twelve feet in diameter. Three ditches ſurround the whole at different diſtances. The area contained within the outermoſt wall may be about 13 acres. The inner one paſſes through a part of the caſtle, within which there was a place for the ſecurity of the boats, either from the effects of the weather or an enemy. While Scotland was a diſtinct kingdom from England, this fort was the frontier garriſon againſt Carliſle. The marquis of Annandale, among his other titles, aſſumes that of conſtable, or hereditary keeper of the caſtle of Lochmaben. To this office was attached a ſalary of 300*l*. Scotch, along with the fiſhings of the lochs. For the maintenance of the troops compoſing the garriſon, the government had likewiſe what was called a *laird-a-mart*, or *lardiner* *mart* cow, which was one of the beſt fat cows from every pariſh in Annandale. Very little of the caſtle now remains, it having been completely pillaged of its materials for the conſtruction and ornament of many of the houſes in the neighbourhood.

Between this caſtle and the Kirk-lochs, cloſe to the town, are the veſtiges of another fort of more ancient date. Tradition reports that the ſtones were removed to aſſiſt in building another caſtle, probably that in the loch. The ſituation of this caſtle is fine, and commands a beautiful proſpect over an extenſive plain. It was originally the reſidence of the Bruce family, before they aſcended the throne of Scotland. It is ſaid that king Robert I. was born here.

Contiguous to the caſtle firſt mentioned, on the banks of the Annan, lies a large tract of fertile land, called the Four-towns, as comprehending four populous villages. Theſe lands were originally granted by one of the Scottiſh monarchs to his houſhold ſervants, and the property of each being very ſmall, bare poſſeſſion was declared a ſufficient title. When any part of this property is transferred, it is only neceſſary to mark the tranſaction in the books of the lord of the barony. In meaſuring the lands of this diſtrict, an ell, called the barony ell, is made uſe of, which contains 42 inches, whereas the common ell of the country is only 38 inches.

Lochmaben and its vicinity derive no ſmall degree of celebrity, as the ſcene of ſome of the heroic actions of the renowned ſir William Wallace. According to the population report of 1801, this pariſh contained 499 houſes, and 2053 inhabitants.

LOCHNEV, a town of Sweden, in the province of Smaland; 60 miles N. of Calmar.

LOCHSTETT, a town of Pruſſia, in the province of Smaland, near which are the ruins of a caſtle, in which was a dungeon, that ſerved for a priſon; four miles N. of Pillau.

LOCHVITZE, a town of Ruſſia, in the government of Tchernigov, on the Suſa; 96 miles S.E. of Tchernigov. N. lat. 50° 20′. E. long. 28° 14′.

LOCIS COMMUNIBUS. See COMMUNIBUS.

LOCK, MATTHEW, in *Biography*, organiſt and compoſer to his majeſty Charles II., was a native of Exeter, and a choriſter in the cathedral of that city, while William Wake was organiſt there. He had afterwards inſtructions in muſic from Edward Gibbons, and had ſo much diſtinguiſhed himſelf as a profeſſor of abilities, that we are told in the continuation of ſir Richard Baker's chronicle, he was appointed to compoſe the muſic for the public entry of the king at the reſtoration, and captain Henry Cook for his coronation.

But he ſeems firſt to have appeared as an author in 1657, during the interregnum, by the publication of his "little conſort of three parts for viols or violins, conſiſting of pavans, ayres, corants, ſarabands, in two ſeveral varieties, the firſt twenty of which are for two trebles and a baſe."

Some of his compoſitions appear in the ſecond part of John Playford's continuation of Hilton's "Catch that catch can," in 1667. Of which publication, the ſecond part contains "Dialogues, Glees, Ayres, and Ballads, of two, three, and four voices," among which we find the moſt pleaſing of Lock's compoſitions; "Never trouble thyſelf about times or their turnings," a glee for three voices.

Lock was the firſt who attempted dramatic muſic for the Engliſh ſtage, if we except the maſques that were performed at court, and at the houſes of the nobility, in the time of Charles I., and during the reign of Charles II. When muſical dramas were firſt attempted, which Dryden calls heroic plays and dramatic operas, Lock was employed to ſet moſt of them; "Circe," written by ſir William Davenant's ſon, Dr. Davenant, was ſet by Banniſter; but the *ſemi-operas*, as they were called, the Tempeſt, Macbeth, and Pſyche, tranſlated from the French of Moliere by Shadwell, were ſet to muſic by Lock. The Tempeſt and Pſyche were performed in 1673, with muſic, dancing, and ſplendid ſcenes, but not printed till 1675, when it was publiſhed with the following title: "The Engliſh Opera; or the vocal Muſic in Pſyche, with the inſtrumental therein intermixed. To which is adjoined the inſtrumental Muſic in the Tempeſt. By Mathew Lock, compoſer in ordinary to his Majeſty, and Organiſt to the Queen." This publication is dedicated to James duke of Monmouth. There is a preface of ſome length by the compoſer, Matthew Lock, which, like his muſic, is rough and nervous, exactly correſponding with the idea which is generated of his private character, by the peruſal of his controverſy with Salmon, and the ſight of his picture in the muſic-ſchool at Oxford. It is written with that natural petulance which probably gave birth to moſt of the quarrels in which he was involved. He begins with a complaint of the tendency of his brother muſicians "to peck and carp at other men's conceptions, how mean ſoever may be their own. And expecting to fall under the laſh of ſome ſoft-headed or hard-hearted compoſer," he ſets about removing "the few blocks at which they may take occaſion to ſtumble," with a degree of indignation that implies an iraſcible ſpirit under no great governance. The firſt objection which he thinks likely to be made, is to the word opera, to which he anſwers, that it is a word borrowed from the Italian, who by it diſtinguiſhed this kind of drama from their comedies, which, after a plan is laid, is ſpoken extempore; whereas this is not only deſigned, but written with art and induſtry; and afterwards ſet to ſuitable muſic. In which idea he has produced the following compoſitions, which, for the moſt part, are "in their nature ſoft, eaſy, and, as far as his abilities could reach, agreeable to the deſign of the poet. For in them there is ballad to ſingle air, counterpoint, recitative, fugue, canon, and chromatic muſic, which variety, without vanity be it ſaid, was never in court or theatre, till now preſented, in this nation." He confeſſes, however, that ſomething had been attempted before in this way of compoſition, but more by himſelf than any other. And adds, "that the author of the drama prudently conſidering, that though Italy was and is the great academy of the world for muſic and this ſpecies of entertainment, yet as this piece was to be performed in England, which is entitled to no ſuch praiſe, he mixed it with interlocutor, as more proper to our genius."

He concludes his peeviſh preface by confeſſing, that "the inſtrumental muſic before and between the acts, and the entries in the acts of Pſyche, were omitted by the conſent of the author, Signor Gio. Baptiſta Draghi; and that the tunes of the entries and dances in the Tempeſt (the dances being changed) were omitted for the ſame reaſon."

Here we have a ſhort hiſtory of theſe early attempts at dramatic muſic on our ſtage, in which, as in the moſt ſucceſsful repreſentations of this kind in later times, the chief part of the dialogue was ſpoken, and recitative, or muſical declamation, which ſeems to be the true criterion and characteriſtic of Italian operas, but ſeldom uſed, unleſs merely to introduce ſome particular airs and choruſes: as in the modern Comus, the air, "On ev'ry hill, in ev'ry dale," is preceded by the ſhort recitative "How gentle was my Damon's air."

Upon examining this muſic, it appears to have been very much compoſed on Lulli's model. The melody is neither recitative nor air, but partaking of both, with a change of meaſure as frequent as in any old French opera which we ever ſaw.

Lock had genius and abilities in harmony ſufficient to have ſurpaſſed his model, or to have caſt his movements in a mould of his own making; but ſuch was the paſſion of Charles II. and conſequently of his court at this time, for every thing French, that in all probability Lock was inſtructed to imitate Cambert and Lulli. His muſic for the witches in Macbeth, which, when produced in 1674, was as ſmooth and airy as any of the time, has now obtained, by age, that wild and ſavage caſt which is admirably ſuited to the infernal characters that are ſuppoſed to perform it.

In the third introductory muſic to the Tempeſt, which is called a *curtain tune*, probably from the curtain being firſt drawn up during the performance of this ſpecies of overture, he has, for the firſt time that is come to our knowledge, introduced the uſe of *creſcendo* (louder by degrees,) with *diminuendo*, and *lentando*, under the words *ſoft* and *ſlow by degrees*. No other inſtruments are mentioned in the ſcore of his opera of Pſyche, than *violins* for the ritornels; and yet, ſo ſlow was the progreſs of that inſtrument during the laſt century, that in a general catalogue of muſic in 1701, ſcarce any compoſitions appear to have been printed for its uſe.

This muſician was of ſo iraſcible a diſpoſition, that he ſeems never to have been without a quarrel or two on his hands. For his furious attack on Salmon, for propoſing to reduce all the clefs in muſic to one, (ſee SALMON and CLEF,) he had a quarrel with the gentlemen of the Chapel Royal, early in Charles II.'s reign. Being compoſer in ordinary to the king, he produced for the Chapel Royal a morning ſervice, in which he ſet the prayer after each of the ten commandments, to different muſic from that to which the ſingers had been long accuſtomed, which was deemed an unpardonable innovation, and on the firſt day of April 1666, at the performance of it before the king, there was a diſturbance and an obſtruction for ſome time to the performance. To convince the public that it was not from the meanneſs or inaccuracy of the compoſition, that this impediment to its performance happened, Lock thought it neceſſary to print the whole ſervice; and it came abroad, in ſcore, on a ſingle ſheet, with a long and laboured vindication, by way of preface, under the following title; "Modern church-muſick pre-accuſed, cenſured and obſtructed in its performance before his majeſty."

Lock was long ſuſpected of being a Roman Catholic, and it is probable that this new ſervice, by leaning a little more towards the maſs, than the ſervice of the Proteſtant cathedral, may have given offence to ſome zealous members of the church of England.

The public were indebted to Lock for the firſt rules that were ever publiſhed in England, for a *baſſo continuo*, or *thorough-baſe*; theſe rules he gave to the world, in a book entitled "Melotheſia," London, oblong 4to. 1673. It is dedicated to Roger l'Eſtrange, eſq. afterwards ſir Roger l'Eſtrange, an ingenious man, a good muſician, and an encourager of its profeſſors. It contains, beſides the thorough-baſe rules, ſome leſſons for the harpſichord and organ by Lock himſelf, and others. He was author likewiſe of ſeveral ſongs printed in "The Treaſury of Muſic," "The Theatre of Muſic," and other collections of ſongs. In the latter of theſe is a dialogue, "When death ſhall part us from theſe kids," which, with Dr. Blow's "Go, perjured man," was ranked among the beſt vocal compoſitions of the time.

It is preſumed, that when he was appointed compoſer in ordinary to the king, he was profeſſionally a member of the church of England; but it is certain that he went over to the Romiſh communion afterwards, and became organiſt to queen Catherine of Portugal, the conſort of Charles II. and died a Papiſt in 1677.

LOCK, a well-known inſtrument for ſecuring doors and preventing them from being opened, except by means of the key adapted to it. A common lock conſiſts of a ſtrong bolt, which muſt be fitted in a proper box or caſe affixed to the door, and incloſing it on all ſides, to defend it from violence, that it cannot be withdrawn, except by the application of the key, which ſhould enter the lock by a ſmall key-hole, and be ſurrounded by numerous wards, that occaſion the paſſage the key paſſes through, in turning round to move the bolt, to be very crooked and intricate, and thus preventing the introduction of any inſtrument or falſe key to withdraw the bolt. The third part of the lock is the tumbler, which is a catch or click holding the bolt from being withdrawn, except the tumbler is firſt removed by the key, which is done at the ſame time it ſhoots the bolt. This common lock cannot be made perfectly ſecure from being picked or opened without the right key, from the circumſtance that the wards, though they may be variouſly diſpoſed, ſo as to require a very crooked key, muſt be always left fixed in the lock, and their figure may be taken by introducing a ſmall falſe key, covered with wax or other plaſtic ſubſtance, and receiving the impreſſion of the wards, from which information a falſe or ſkeleton key may be made, that will enter the lock and withdraw the bolt; or, if it will only raiſe up the tumbler, the bolt may ſometimes be forced back by other means. Another reaſon of the inſufficiency of the common lock is, that the variations capable of being made in the arrangement of the wards are not ſufficient to produce the required number of locks without having great numbers exactly alike, and their keys capable of opening each other reciprocally; from which circumſtance they become but an imperfect ſecurity, as any ill-diſpoſed perſon may, by furniſhing himſelf with a great variety of old keys, be enabled to open almoſt any common lock; particularly if theſe keys are filed away to ſkeletons, that is, leaving as little as poſſible of the ſolid part of the key, which will then have a greater chance of paſſing in between the intricate wards.

To produce a lock which would be free from theſe objections has been the ſtudy of many ingenious mechanics, whoſe various locks have different properties and advantages. We have devoted *Plate* XXI. *Miſcellany*, to the explanation of two capital locks, one by Mr. Thomas Rowntree, which is an improvement upon the common tumbler-lock, and another by Mr. Joſeph Bramah, which is on an entirely different principle.

Mr. Rowntree's lock is repreſented in *figs.* 5, 6, 7, and 8; in theſe the following parts are thoſe of the common lock: A A is the plate which incloſes the whole mechaniſm, and faſtens it to the door; B B, *fig.* 6, is the bolt, which is guided in its motion by ſliding under two bridges C, D, ſcrewed to the main plate; E, E, are four pillars which ſupport a plate to cover the works: this plate has the key-hole in it; F, &c. are the circular wards ſurrounding the centre pin; and *a*, *fig.* 6, is the key which, in turning round, acts in a notch *r* in the bolt, and ſhoots it forwards or backwards; G is the tumbler: it is a plate ſituated beneath the bolt and moving on a centre pin at *d*. See alſo *fig.* 8, which is a ſeparate view of the tumbler; it has a catch *e* projecting upwards from it, which enters the notches *f* or *g*, *fig.* 6, in the bolt, and thus firmly retains the bolt; the former when it is locked, and the latter when it is drawn back. H is a ſpring which preſſes the tumbler forwards; the key *a*, in turning round, acts firſt againſt the part *c c* of the tumbler, and raiſes it ſo as to remove the catch *e* from the notches *f* or *g*, and then the key enters the notch *r* in the bolt, and moves it. In this, which is the common lock, it will be ſeen there is no ſecurity, except what ariſes from the intricacy of the wards F ſurrounding the key; for a falſe key, or any other inſtrument which is of the ſame length as *a*, will, if it can paſs the wards, raiſe the tumbler and draw back the bolt. Mr. Rowntree has, by applying an ingenious contrivance to this lock, rendered it ſo ſecure, that it will be nearly impoſſible to pick or open it with any other than the true key. To the tumbler he has added a piece of metal *h*, *figs.* 7 and 8, called its *fin*, fixed to its lower ſide. When the tumbler is locked in the notches *f*, *g*, of the bolt, the fin applies itſelf to a cluſter of ſmall wheels I, *figs.* 5 and 8, all fitted on one centre pin beneath the tumbler: the edges of theſe wheels ſtop the fin *h*, and prevent the tumbler being raiſed; but each wheel has a notch *i*, *fig.* 8, cut in its circumference, and when they are all placed, ſo that every notch is turned to the ſide oppoſite the fin of the tumbler, and forming one notch through the whole cluſter of wheels, then the fin is at liberty to enter this notch, allowing the tumbler to riſe: but when the tumbler is down, and the plain edges of all or any of the wheels are preſented to the fin, the tumbler cannot be raiſed unleſs the wheels are firſt put into the right poſition above-mentioned: this is done by a number of levers K, *figs.* 5 and 7, all centred on one pin at *k*. At the oppoſite end each has a tooth *m*, entering a notch in the wheel belonging to it, ſo that when any lever is preſſed outwards it turns its wheel round. The levers are preſſed towards the key by a ſpring *n* applied to each, and in this ſtate they reſt againſt a pin *o* fixed in the plate. The wheels are now diſarranged completely, every one preſenting its plain edge to the fin, but every one requiring a different degree of motion to bring the notch round to the proper poſition. When the key is introduced and turned round, it firſt operates upon the curved part *p q*, *fig.* 5, of the levers K, and raiſing them, turns all the circles I at once into the proper poſition. The key, in turning farther round, operates on the part *c c*, *fig.* 6, of the tumbler, now at liberty to move, and by raiſing it releaſes the bolt, and in turning ſtill further round, it ſeizes the notch *r* of the bolt, as in *fig.* 6, and ſhoots it. The key is cut into ſteps of different lengths, as ſhewn at *v v*, in *fig.* R: each ſtep operates on its reſpective lever K in a different degree, and turns its circle I the proper quantity. The notch at *s* acts upon the tumbler, and the plain part *t* moves the bolt. In this lock there is no poſſibility of picking it, for if all the levers except one were raiſed the proper quantity, that one would detain the tumbler as effectually as the whole number; and a falſe key, beſides having the wards as R, muſt have all the notches *v*, *v*, of the exact depth, neither greater nor leſs, or it will not open the lock, even if one alone is incorrect. If the key is loſt, when a new one is made, the maker takes out the levers K and circles I, and arranging them in a new order, one upon the other, making the new key to fit the new arrangement, and then the old key will not open the lock; though none of the parts are altered, but only their arrangement. The ſame may be done if it be ſuſpected that an impreſſion has been fraudently taken from the key to make a falſe one by.

The locks invented by Mr. Joſeph Bramah diſplay great ingenuity, and demand a particular deſcription, having been in very general uſe for many years paſt, and greatly admired. He obtained a patent for his invention in 1784, and eſtabliſhed a manufactory of them, in which he employed a number of ingenious tools and engines for the fabrication of the different parts. One of Mr. Bramah's ſimpleſt forms of a lock for a drawer, or for a door, is repreſented in *figs.* 1, 2, 3, 4, *Plate* XXII. *Miſcellany*, in which A repreſents the bolt, fitted to ſlide on the metal plate B B C, by paſſing through a hole in the ſide C, which is turned up, as ſhewn in *fig.* 3: the other end of the bolt is guided by paſſing under proper grooves in the lower ſide of the circular box D D, which is ſcrewed to the plate B to confine the bolt down. It contains the whole mechaniſm of the lock, conſiſting of an interior cylinder or barrel E E, ſhewn in the ſection *fig.* 3, with its appendages in perſpective in *fig.* 4. This barrel is fitted to turn round within the box D D, the upper end *a a* being received into a cavity exactly fitting it, and the middle encompaſſed by a circular ring of ſteel plate *b b*, ſcrewed into the box as ſhewn in *fig.* 3, and one-half ſhewn at *b*, *fig.* 4. The ring enters a circular groove formed round the barrel, and thus confines it from having any other motion than a rotation on its axis, and this only by the aid of the key R, as will be explained. The barrel has a hole through its centre, which is cloſed at bottom by a circular plate F, ſcrewed to it, and ſupporting the central pin G, which occupies the centre of the hole through the barrel: this centre pin guides the key in entering the lock. When the barrel E E is turned round by the key, it ſhoots the bolt A, by an ingenious contrivance, explained in *fig* 2, an aperture being cut through the plate B B C to exhibit it. The plate F, on the lower end of the barrel E, has a pin *f* projecting from it: this pin enters a curved opening, at a ſmall diſtance from the centre, and therefore deſcribes a circle when the barrel is turned round, cut through the bolt A, as is ſhewn by the dark curve F in *fig.* 2. In the poſition there ſhewn the bolt is withdrawn, and the pin *f*, reſting againſt the ſolid part of the groove, prevents the barrel being turned round any farther in the direction from F to *f*: but by the application of the key, the barrel may be turned in the other direction from *f* to F, in which courſe it paſſes round in a circular part of the groove, and therefore produces no motion of the bolt A, until the pin *f* ſtrikes the ſtraight part *g* of the groove, and acts againſt it to throw the bolt forwards: and when the barrel has made a complete circuit, and the pin *f* is again come to the ſame poſition it was at firſt, the bolt is ſhot out as at *fig.* 1, and the pin is reſting in the hollow *h*, which prevents it moving any farther in the ſame direction. When the barrel is turned back again, the pin *f* acts againſt the notch *i* and the curved part *k* of the groove, and withdraws the bolt into the poſition of *fig.* 2: now the pin *f*, either when the bolt is ſhot out or in, is in a right line with the centre of the barrel E, to which it is fixed, and the direction of the bolt's motion. By this means, no force whatever applied to drive back the bolt can have the leaſt tendency to turn the barrel round, and ſtrain the mechaniſm which prevents its motion, unleſs the parts are firſt put into a particular arrangement, by the application of the key. The interior mechaniſm muſt be explained by *fig.* 4, in which *l*, *m*, *n*, repreſent ſmall ſteel ſliders, which are fitted into proper grooves or ſlits, made in the ſubſtance of the barrel E. Of theſe there are ſix in number, arranged round the barrel, and projecting a little from its exterior ſurface in the ſmall part. Theſe ſliders are received in notches *y*, *z*, in the fixed ſteel ring *b b*, before deſcribed; and thus effectually detain the barrel at ſix points from being turned round, except it is firſt unlocked by the key R being introduced at the key-hole H, and the ſliders preſſed down by it, ſo as to bring the notches (of which each ſlider has one, as at *r* *fig.* 4.) all oppoſite the ſteel plate *b b*, and then the barrel may be turned round. When the key is abſent, the ſliders are raiſed up by a braſs ring *v* ſliding on the central pin G, and lifted up by a ſpiral ſpring *w*. The key has ſix notches cut in the end of it, as ſhewn at S, which is an end view: each notch in the key includes one of the ſix ſliders *l*, *m*, *n*, and

and the key, being forced down into the key-hole H, depreſſes all the ſliders at once, until the projecting leaf *t* of the key ſtops upon the bottom of the receſs *x*, cut in the upper edge of the barrel. In this poſition the ſliders are depreſſed, ſo that the notch *r* made in each ſlider comes exactly oppoſite the ſteel ring *b b*, and the barrel is at liberty to turn round all the ſliders, being by this means removed, or at leaſt relieved, from the ſteel ring, which, as before-mentioned, embraces a groove cut round the barrel, but which cannot turn round therein unleſs the ſliders are alſo moved by the key, that the notches cut in them coincide with the groove cut round the barrel, and then it can turn freely round. The key, having thus relieved the barrel by being thruſt in as far as it can go, obtains a hold of the barrel to turn it round, by the leaf *t* entering the receſs *x*, which it exactly fills up, ſo as to form a continuation of the circular top of the barrel: but as ſoon as the key is turned round with the barrel a ſmall quantity, its leaf is caught beneath the circular cavity in the top of the box D, and thus the key is prevented from being thrown out by the ſpiral ſpring *w*, until it has been turned quite round, and locked or unlocked the bolt: then the leaf of the key coming oppoſite the enlargement *z*, *fig.* 1, of the key-hole H, the ſpring throws the key out and raiſes all the ſliders, that they may interlock with the ſteel plate *b b*, and prevent the barrel from turning, unleſs the key is again put in, (its leaf being oppoſite the aperture *z* of the key-hole,) and being thruſt forwards as far as it will go, the barrel will turn round very eaſily; and when it has made a complete circuit, the lock is opened, and the key thrown out of the key-hole by the ſpring.

The ſecurity of this ingenious lock from being picked, or opened by a falſe key, depends upon a circumſtance not yet mentioned, which is, that the notches in the ſix ſliders are ſo made, that every one requires to be depreſſed a different quantity to bring them all at once oppoſite the ſteel ring, in which poſition alone the barrel can be moved. For this reaſon the ſix notches in the key are all of different depths, correſpondent to the poſitions of the notches in their reſpective ſliders; and unleſs each notch in the key is of the proper depth, the lock cannot be opened, for any one being too deep, that ſlider will not be preſſed low enough to relieve the barrel, and will hold it faſt, though all the others may be correct: on the other hand, any notch not being of ſufficient depth, the ſlider it acts upon will be preſſed too far, and in this caſe the notch in it, having paſſed by the ſteel ring, will lock the barrel as effectually as though it was not far enough. Thus this lock admits of an immenſe number of combinations; 1ſt, in the number of the ſliders; 2dly, the depths of the different notches in the key; and 3dly, the arrangement of theſe ſliders. The combination of theſe three changes admits ſuch an immenſe number of varieties of locks, that it never need happen that two locks ſhould be made to open by the ſame key. Any of Mr. Bramah's locks may be arranged ſo as to require a new and different key in caſe the original ſhould be loſt or ſtolen: for this purpoſe the lock muſt be opened, and the ſliders taken out and changed into different grooves: a new key muſt now be made, with the grooves of the ſame depth of the original key, but arranged in a different order, correſponding with the new arrangement of the ſliders. The old key will not now open the lock.

To pick a lock of this kind is perhaps impoſſible; becauſe, though the ſliders are expoſed to the examination of any perſon, yet no information can be obtained of the depth of each of the ſliders required to be depreſſed; for, unleſs they are all together preſſed down, the barrel cannot be turned in the leaſt, and without turning it, no gueſs can be made by preſſing down any one ſlider of the depth at which the notch in it will be oppoſite the ſteel ring. Another great advantage of theſe locks is, that from the circumſtance before explained, of the bolt having no action to turn the barrel, though the barrel has a great power to ſhoot the bolt, a ſtrong lock may have but a very ſmall key. For inſtance, the bolt of the lock, in the plate which is drawn its full ſize, is of great ſtrength, while the key R is ſo ſmall, that it may always be carried ſuſpended to the watch chain, and then it will not be in danger of being loſt or miſlaid, as one may happen to loſe a key, and give opportunity for ill diſpoſed perſons to make a falſe key from it, unknown to the owner.

A lock invented by Mr. Stanſbury, an American gentleman, has great merit. To explain it, we muſt ſuppoſe that a flat circular plate is fitted to turn round upon the centre pin for the key, and that this plate, when turned round, ſhoots the bolt, which may be done by various means. The locking part conſiſts of four, ſix, or more ſmall ſteel pins, which are received in holes made very near each other, through both the circular turning plate, and the fixed plate beneath it. By theſe pins the circular plate is held faſt from turning. The key has the ſame number of pins, and arranged in the ſame poſition and diſtance as the pins in the plate. The key being introduced, it is preſſed forwards againſt the circular plate, and turned round till the pins in it come over the pins in the circular plate, and the preſſure of the hand forces the pins out of the circular plate, the pins in the key occupying the place of them. The plate is now relieved, and the key has hold of the plate to turn it round and open the lock. Each pin is provided with a ſpring behind the fixed plate to force it forwards. The difficulty of making a falſe key to this lock is very great; as any error in the number, ſize, poſition, or length of the pins, will prevent it from opening the lock. To avoid the danger of impreſſions being taken, many marks are ſtamped upon the circular plate, which are exactly the ſame at the marks of the real pins: thus an impreſſion taken from it would only miſlead.

Mr. Stanſbury has alſo made an ingenious improvement upon the common ſpring door-lock. The handle which opens the ſpring catch for faſtening the door, inſtead of requiring to be turned round, is made ſo that it withdraws the ſpring catch, by puſhing the handle on one ſide of the door and pulling it on the other. This method is extremely convenient; for preſſing the handle releaſes the lock, and continuing the preſſure opens the door, and pulling the handle on the other ſide has the ſame effect. A perſon with his hands full may open ſuch a door by only leaning againſt the handle.

Lock, or *Weir*, in *Inland Navigation*, the general name for all thoſe works of wood and ſtone, made to confine and raiſe the water of a river: the banks alſo which are made to divert the courſe of the river, are called by theſe names in ſome places. But the term *lock*, or *pound-lock*, is more particularly appropriated to expreſs a contrivance, conſiſting of two gates, or pairs of gates, called the lock-gates, and a chamber between, in which the water may be made to coincide with the upper or lower canal, according as the upper or lower gates communicating with it are opened; by which means boats are raiſed or depreſſed from one level or reach of a canal to another. See *Plate* V. *Canals*.

Lock *of Water*, is the meaſure equal to the content of the chamber of the locks, by which the conſumption of water on a canal is eſtimated.

Lock-*keeper*, a perſon who attends the locks to take care of them, and to aſſiſt the boatmen in paſſing through them.

Lock-*paddles* are the ſmall ſluices that ſerve to fill and empty the locks.

Lock-*ſils* are the angular pieces of timber, (*h, h, Plate* V. *Canals, fig.* 36.) at the bottom of the lock, againſt which the gates ſhut.

Lock-*weirs*, or *Paddle-weirs*, are the over-falls behind the upper gates, (*z, z, Plate* V. *fig.* 35.) by which the waſte-water of the upper pound is let down through the paddle-holes into the chamber of the lock.

To Lock, in *Fencing*, is to ſeize your adverſary's ſword-arm, by twining your left arm round it, after you cloſe your parade, ſhell to ſhell, in order to diſarm him.

LOCKARTSBURG, in *Geography*, a town of America, in Luzerne county, Pennſylvania, ſituated on an iſthmus, formed by the confluence of the Suſquehanna and Tioga rivers, about a mile above their junction.

LOCKE, John, in *Biography*, one of the greateſt philoſophers and moſt powerful writers that ever adorned this country, was born at Wrington, in Somerſetſhire, on the 29th of Auguſt 1632. His father was a gentleman of ſtrict probity and economy, and he poſſeſſed a handſome fortune. He took great pains in the education of his ſon; and, when he was of a proper age, ſent him to Weſtminſter ſchool, where he continued till the year 1651, when he was entered a ſtudent of Chriſt-church college, in the univerſity of Oxford. Here he was diſtinguiſhed above all his contemporaries, and was conſidered to be the moſt ingenious young man in the college. It appears, however, that he was diſguſted with the method of ſtudy preſcribed to him, which was after the manner of the Peripatetics; and it is ſaid, that the books which firſt gave him a reliſh for the ſtudy of philoſophy were thoſe written by Des Cartes. Having taken his degrees in arts in 1655 and 1658, Mr. Locke for ſome time cloſely applied himſelf to the ſtudy of phyſic; and it is certain that, for a ſhort time, he followed it as a profeſſion. In the year 1664 he accepted an offer to go abroad, as ſecretary to ſir William Swan, envoy from Charles II. to the elector of Brandenburgh; but returning to England again within leſs than a year, he reſumed his ſtudies at Oxford with renewed vigour, applying himſelf particularly to natural philoſophy. In 1666 he was accidentally introduced to the acquaintance of lord Aſhley, afterwards earl of Shafteſbury, in the capacity of a medical practitioner, during the abſence of the phyſician who regularly attended his lordſhip. When the noble lord left Oxford to go to Sunning Hill, he made Mr. Locke promiſe him a viſit there, which promiſe he performed in 1667. Having ſecured him as an inmate, lord Aſhley ſuffered himſelf to be governed entirely by his advice, and became ſo much attached to him, that he would not ſuffer him to practiſe medicine out of his own family, except in the caſe of ſome particular friends; and perceiving that the great abilities of Mr. Locke were calculated to render him eminently ſerviceable to the world in other departments of knowledge, urged him to apply his ſtudies to ſtate affairs and political ſubjects. To theſe Mr. Locke was naturally inclined, and ſucceeded ſo well, that lord Aſhley began to conſult him on all occaſions. He was now introduced to the ſociety of ſome of the moſt eminent men of the age, who were all delighted with his converſation. In the year 1668, Mr. Locke accompanied the earl and counteſs of Northumberland in a tour to France, and remained in that country with the lady, while his lordſhip ſet off to Italy, with an intention of viſiting Rome. This nobleman, however, died on his journey, and Mr. Locke accompanied the counteſs to England, and again took up his reſidence at lord Aſhley's. His lordſhip, at that period chancellor of the exchequer, having, in conjunction with other noble lords, obtained a grant of Carolina in North America, employed Mr. Locke to draw up a conſtitution for that province. In executing this taſk, he had formed articles relative to religion and public worſhip on thoſe enlarged principles of toleration, which were agreeable to his own enlightened views upon that ſubject. The clergy, however, jealous of a diminution of their powers, cauſed an additional clauſe to be inſerted, ſecuring the countenance and ſupport of the ſtate only to the exerciſe of religion according to the diſcipline of the eſtabliſhed church. Mr. Locke, notwithſtanding his connection with lord Aſhley, made frequent viſits to Oxford, though he was at the ſame time engaged to inſpect the education of his lordſhip's eldeſt ſon, an office which he executed with the greateſt care, and to the entire ſatisfaction of his employer. To Mr. Locke, likewiſe, was confided the important charge of ſelecting a wife for the young man. This was a taſk of great difficulty, as the father determined he ſhould only marry a lady of good family, of an agreeable temper, a fine perſon, and, above all, of good education and excellent underſtanding. Notwithſtanding the difficulties attending ſuch a commiſſion, Mr. Locke undertook it, and executed it to the perfect ſatisfaction of all parties. The eldeſt ſon by this marriage, afterwards the author of the "Characteriſtics," was committed to the care of Mr. Locke in his education, and gave evidence to the world of the maſter-hand which had directed and guided his genius. In 1670 Mr. Locke began to form the plan of his "Eſſay on Human Underſtanding;" but he was too much engaged by his patron to make much progreſs in the work. In 1672, lord Aſhley was created earl of Shafteſbury, and appointed to the high dignity of lord high chancellor of England. His lordſhip immediately made him his ſecretary of the preſentations; but he held that place only till the end of the following year, when the earl was obliged to reſign the great ſeal. After this, lord Shafteſbury was preſident of the board of trade, and Mr. Locke was appointed ſecretary to the ſame. The commiſſion being diſſolved in 1674, he was again at leiſure, was admitted to the degree of bachelor of phyſic, and began to turn his attention to that faculty, as the means of future ſupport. He was at this time in the higheſt eſtimation with ſeveral perſons of eminence in the medical profeſſion: Dr. Sydenham, among others, ſpeaking of him, ſays, "If we conſider his genius, and penetrating and exact judgment, or the ſtrictneſs of his morals, he has ſcarcely any ſuperior, and few equals now living." In 1675, Mr. Locke ſought relief from a pulmonary complaint by travelling to the ſouth of France, where he became acquainted with the earl of Pembroke, to whom he communicated his plan of writing the "Eſſay on Human Underſtanding." He afterwards ſettled at Paris, where he obtained the friendſhip of ſeveral men of letters. In 1679 the earl of Shafteſbury, being reſtored to favour at court, and made preſident of the council, ſent to requeſt that Mr. Locke would return home without delay. He inſtantly complied; but within ſix months that nobleman was again diſplaced, for refuſing his concurrence with the deſigns of the court, which aimed at the eſtabliſhment of popery and arbitrary power; and in 1682, he found it neceſſary to retire to the continent, to avoid a proſecution for high treaſon, on account of offences charged upon him, probably without the colour of reaſon or truth. Mr. Locke, whoſe character was above all ſuſpicion, remained ſteadily attached to his patron, following him into Holland; and upon his lordſhip's death, which happened ſoon afterwards, he did not think it ſafe to return to his native country, where his intimate connection with lord Shafteſbury had created him ſome powerful and malignant enemies. Their malice purſued him to the utmoſt extent of their means; and the dean of Chriſt-church had orders from the king to eject Mr. Locke from his ſtudent's place, which was accordingly done. On the acceſſion of James II., William Penn, the quaker, who was the friend of Locke in his adverſity, uſed his intereſt with the king to procure a pardon for him; and would have obtained it, had not Mr. Locke declined the acceptance of ſuch an offer, declaring that he had no occaſion for a pardon, having never been guilty of any crime. In 1685, when the duke of Monmouth and his party were making preparations in Holland for his raſh and unfortunate enterprize, the Engliſh envoy at the Hague demanded that Mr. Locke, among others, ſhould be given up, on ſuſpicion of his being actively engaged in the undertaking. This ſuſpicion, though entirely groundleſs, obliged him to lie concealed nearly a year; till it was rendered perfectly evident, even to his enemies and their ſpies, that he had no concern whatever in the buſineſs. Towards the end of the year 1686 he appeared again in public, and ſoon afterwards was the principal agent in forming a literary ſociety at Amſterdam, of which Limborch, Le Clerc, and other learned men were members, who met together weekly for converſation upon ſubjects of univerſal learning. In the following year he finiſhed his great work, the "Eſſay concerning Human Underſtanding," which had been the principal object of his attention ſeveral years, and which proves how well he ſpent the period of his exile from England. That the public might be apprized of the outlines of his plan, he himſelf made an abridgment of it, which his friend Le Clerc tranſlated into French, and inſerted in one of his "Bibliotheques." This abridgment was ſo highly approved by the literati of that period, and by thoſe who were ſincerely attached to truth and juſt principles, that they took every opportunity of expreſſing the ſtrongeſt deſire to ſee the complete work in its original ſtate. During his concealment, he wrote his "Letter concerning Toleration," which was firſt publiſhed in the Latin language at Gouda, in 1689, and entitled "Epiſtola de Tolerantia ad clariſſimum Virum T. A. R. P. T. O. L. A. Scripta à P. A. P. O. J. L. A." The former of theſe ſets of letters were intended to ſignify Theologiæ apud Remonſtrantes Profeſſorem, Tyrannidis Oſorem Limburgium Amſtelodamenſem; and the latter, Pacis Amico, Perſecutionis Oſore, Johanne Locke, Anglo. This letter he afterwards tranſlated into Engliſh, and publiſhed in London in the year 1690. It was ſpeedily tranſlated into the Dutch and French languages, and has been exceedingly popular with liberal people of all countries from that period to the preſent. It has been frequently reprinted in forms adapted for general circulation, and has been diſtributed by perſons of fortune and rank, among whom may be mentioned, in our own country, his grace the late duke of Grafton. This epiſtle, though ſo highly approved, was ſeverely attacked by a clergyman of Oxford, who wrote three pamphlets againſt it; two of which Mr. Locke anſwered, defending and juſtifying his principles with invincible ſtrength of argument: and though he was in a declining ſtate of health, when his antagoniſt, after twelve years' ſilence, publiſhed his third pamphlet againſt it, yet he began a reply to him in a "Fourth Letter concerning Toleration." Though this was not finiſhed, yet the fragment has been publiſhed in Deſmaizeaux's edition of his works.

To return, however, to the narrative of Mr. Locke's life, in the order of time. The revolution of 1688 opened a way for his return into his own country, whither he came in the ſame fleet which conveyed the princeſs of Orange; and upon the reſtoration of public liberty, he did not heſitate to aſſert his own private rights, and accordingly put in his claim to the ſtudent's place in the college of Chriſt's-church, of which he had been unjuſtly deprived. For the ſake of peace, he was adviſed to deſiſt from his claim. As he was conſidered to be a ſufferer for the principles of the revolution, he might have obtained ſome very conſiderable poſt under government: but he contented himſelf with that of "Commiſſioner of Appeals," worth about 200*l. per annum.* In the year 1689, Mr. Locke had an offer to go abroad in a public character; but he declined the honour and advantages attached to ſuch a ſituation, on account of the infirm ſtate of his health: and in the following year he publiſhed his "Eſſay," which has given him an immortal reputation; and which, at the time, though it had many enemies, was ſtyled "one of the nobleſt, moſt uſeful, and moſt original books the world ever ſaw." Thoſe who diſliked every thing like innovation, oppoſed the progreſs of our philoſopher's principles as laid down in his "Eſſay." It was even propoſed, at a meeting of the heads of the houſes of the univerſity of Oxford, to cenſure and diſcourage the reading of it; and after long and warm debates among themſelves, it was agreed that each individual, at the head of a college, ſhould endeavour to prevent it from being read by the ſtudents: a ſure method of rendering every ſpirited young man anxious to peruſe it, and even imbibe its principles. The old and the prejudiced were afraid of the light which was diffuſing itſelf in the world, but they could not reſtrain its effects: the attacks of Mr. Locke's various opponents did but increaſe his reputation, and render his principles more generally ſtudied and adopted. Mr. Locke's next publication was his "Two Treatiſes on Government;" in which he vindicated the principles upon which "the Revolution" was founded, and completely demoliſhed ſir Robert Filmer's falſe principles; pointing out, at the ſame time, the true origin, extent, and end of civil government. About this period, the public coin of the kingdom was known to be in a very bad and depreciated ſtate, having, by being clipped and ſweated, loſt one-third of its weight. The magnitude of this evil, and the miſchiefs which it threatened, called for the attention of parliament; and Mr. Locke, with the view of aſſiſting thoſe who were at the head of affairs to form a right underſtanding of this matter, and to excite them to rectify ſuch abuſes, printed a tract, entitled "Some Conſiderations of the Conſequences of lowering the Intereſt, and raiſing the Value of Money." He had warned the public of their danger, and ſaid, "the nation was in greater danger from a ſecret unobſerved abuſe, than from all thoſe other evils of which perſons were generally ſo apprehenſive; and that if care was not taken to rectify the coin, that irregularity alone would prove fatal to us, though we ſhould ſucceed in every thing elſe." Mr. Locke publiſhed other tracts on the ſame ſubject, by which he convinced the world that he was as able to reaſon on trade and buſineſs as on the moſt abſtract queſtions of ſcience. He was accordingly conſulted by the miniſtry relative to a new coinage of ſilver. With the earl of Pembroke, then lord keeper of the privy ſeal, he was accuſtomed to hold weekly conferences; and he was in habits of intimacy and friendſhip with the earl of Peterborough, at whoſe houſe, at Fulham, he always met with a hoſpitable and kind reception, when the delicacy of his health obliged him to quit the metropolis. He was afterwards obliged to leave London entirely, and accepted of the generous offer of ſir Francis Maſham, at Oates in Eſſex, to become a reſident in his houſe, where he ſpent the remainder of his life. Here he was

was received on his own terms, that he might have his entire liberty, and look upon himſelf as at his own home; and here he chiefly purſued his future ſtudies, being ſeldom abſent, becauſe the air of London grew more and more troubleſome to him. In 1693 he publiſhed his “Thoughts on Education,” which he improved in ſome ſubſequent editions; and in 1695 he was appointed, by the king, one of the “Commiſſioners of Trade and Plantations,” which obliged him to be more frequently in London than he had been for ſome time paſt. In the ſame year he publiſhed his excellent treatiſe, entitled “The Reaſonableneſs of Chriſtianity as delivered in the Scriptures;” of which he afterwards publiſhed a vindication, in anſwer to a ſcurrilous attack by Dr. Edwards, entitled “Socinianiſm unmaſked.” Scarcely was Mr. Locke diſengaged from this controverſy, before he was drawn into another, occaſioned by the publication of Mr. Toland's “Chriſtianity not myſterious,” in which he endeavoured to prove “that there is nothing in the Chriſtian religion not only contrary to reaſon, but even nothing above it;” and in explaining his notions, he made uſe of ſeveral arguments from Mr. Locke's “Eſſay.” About the ſame time, ſeveral treatiſes were publiſhed by ſome Unitarian writers, maintaining that there was nothing in the Chriſtian religion but what was rational and intelligible, which ſentiment had been advanced by Mr. Locke. The uſe which was made of his writings in theſe inſtances, determined Dr. Stillingfleet, biſhop of Worceſter, to make an attack upon the author, in his “Defence of the Doctrine of the Trinity,” publiſhed in 1697. Mr. Locke wrote an anſwer, and the controverſy was carried on till the death of the biſhop: The candid of every party admitted that Mr. Locke was too powerful for the learned prelate, and M. Le Clerc, ſpeaking of the diſcuſſion, ſays, “Every body admired the ſtrength of Mr. Locke's reaſonings, and his great clearneſs and exactneſs, not only in explaining his own notions, but in confuting thoſe of his adverſary. Nor were men of underſtanding leſs ſurpriſed, that ſo learned a man as the biſhop ſhould engage in a controverſy, in which he had all the diſadvantages poſſible: for he was by no means able to maintain his opinions againſt Mr. Locke, whoſe reaſonings he neither underſtood, nor the ſubject itſelf about which he diſputed.” And an Iriſh prelate writing to Mr. Molyneux, the intimate friend of Mr. Locke, thus expreſſes himſelf on the ſubject: “I am wholly of your opinion, that he has laid the great biſhop on his back; but it is with ſo much gentleneſs, as if he were afraid not only of hurting him, but even of ſpoiling or tumbling his clothes. Indeed, I cannot tell which I moſt admire; the great civility and good manners in his book, or the forcibleneſs and clearneſs of his reaſoning.” Never, perhaps, was a controverſy managed with ſo much ſkill and art on one ſide, nor on the other, ſo unjuſtly, confuſedly, or ſo little to the credit of the author. The tracts on this controverſy were the laſt which Mr. Locke committed to preſs: he grew infirm more from diſeaſe than great age, and he determined to reſign his office of “Commiſſioner of Trade, &c.;” but he acquainted no perſon of his intention till he had given up his commiſſion into the king's own hand. His majeſty preſſed him to continue in the poſt, though he ſhould be unable to perform its duties; but Mr. Locke could not be induced to make ſuch a compromiſe, and he inſiſted upon ſurrendering the emoluments of a place that he felt himſelf incapable of filling. From this time, which was the year 1700, he lived altogether at Oates in Eſſex, and applied himſelf, without interruption, entirely to the ſtudy of the holy ſcriptures; and in the employment he found ſo much pleaſure, that he regretted his not having devoted more of his time to it in the former part of his life; and he replied, in anſwer to a young gentleman, who aſked what was the ſhorteſt and ſureſt way for a perſon to attain a true knowledge of the Chriſtian religion? “Let him ſtudy the holy ſcripture, eſpecially the New Teſtament. It has God for its author; ſalvation for its end; and truth, without any mixture of error, for its matter.” In 1703 he ſuffered much from an aſthmatic diſorder, but the pangs of bodily complaint were alleviated by the kind attentions of lady Maſham, who was the daughter of the learned Cudworth: ſtill he foreſaw that his diſſolution was not far diſtant, and he could anticipate it without dread, and ſpeak of it with perfect calmneſs and compoſure. Though few men had need of ſo little preparation for the important change as Mr. Locke, yet he felt it right to receive the ſacrament at home, in company with ſome friends, being unable to go to church. When the ceremony was finiſhed, he told the miniſter, “that he was in perfect charity with all men, and in a ſincere communion with the church of Chriſt, by what name ſoever it might be diſtinguiſhed.” He lived ſome months after this, which he ſpent in acts of piety and devotion: when he was meditating on the wiſdom and goodneſs of the Creator, he could not forbear crying out, “Oh the depth of the riches of the goodneſs and knowledge of God:” what he felt himſelf on this ſubject he was anxious to infuſe into the hearts of others. On the day previouſly to his departure he ſaid, “he had lived long enough, and was thankful that he had enjoyed a happy life; but that, after all, he looked upon this life to be nothing but vanity,” or, as he expreſſes a ſimilar ſentiment, in a letter which he left behind him for his friend Mr. Anthony Collins, one that “affords no ſolid ſatisfaction but in the conſciouſneſs of doing well, and in the hopes of another life.” He had no reſt that night, and begged in the morning to be carried into his ſtudy, where, being placed in an eaſy chair, he had a refreſhing ſleep for a conſiderable time. He then requeſted his valuable friend, lady Maſham, to read aloud ſome of the pſalms, to which he appeared exceedingly attentive, till feeling, probably, the approach of the laſt meſſenger, he begged her to deſiſt, and in a few minutes expired, on the 28th of October 1704, in the 73d year of his age. He was interred in the church of Oates, where there is a monument erected to his memory, with a Latin inſcription, which he had prepared for the purpoſe.

Such was the end of as illuſtrious a philoſopher as ever adorned our country: celebrated not only by his wiſdom, but by his piety and virtue, by his love of truth, and diligence in the purſuit of it, and by a noble ardour in defence of the civil and religious rights of mankind. That Mr. Locke poſſeſſed a noble and lofty mind, ſuperior to prejudice, and capable, by its native energy, of exploring the truth, even in the regions of the intellectual world before unknown; that his judgment was accurate and profound; that his imagination was vigorous; and that he was well furniſhed with the ornaments of elegant learning, were there no other proofs, might be concluded from his great and immortal work, “The Eſſay concerning Human Underſtanding.” Though we cannot agree with the learned author of the “Diverſions of Purley,” “that Mr. Locke never did advance a ſingle ſtep beyond the origin of Ideas and the compoſition of Terms;” yet it muſt be admitted, that this was the main object of his eſſay, though not at firſt perceived by Mr. Locke himſelf, as he acknowledges: but he adds, “when I began to examine the extent and certainty of our knowledge, I found it had ſo near a connection with words, that unleſs their force and manner of ſignification were firſt well obſerved, there could be very little ſaid clearly and pertinently concerning knowledge, which being converſant about truth, had conſtantly to do with propoſitions. And though it terminated in things, yet it was for the moſt part ſo much by the intervention of words, that they ſeemed ſcarce ſeparable from our general knowledge." And again, "I am apt to imagine, that were the imperfections of language, as the inſtrument of knowledge, more thoroughly weighed, a great many of the controverſies that make ſuch a noiſe in the world, would of themſelves ceaſe, and the way to knowledge, and perhaps peace too, lie a great deal opener than it does." Hence the author, juſt referred to, aſſumes, "that the more Mr. Locke reflected and ſearched into the human underſtanding, the more he was convinced of the neceſſity of an attention to language, and of the inſeparable connection between words and knowledge. He ſays, moreover, that it was a lucky miſtake which Mr. Locke made when he called his book "An Eſſay on the Human Underſtanding." For ſome part of the ineſtimable benefit of that book has, merely on account of its title, reached to thouſands more than, I fear, it would have done, had he called it (what it is merely) A Grammatical Eſſay, or a treatiſe on words, or on language. The human mind, or the human underſtanding, appears to be a grand and noble theme, and all men, even the moſt inſufficient, conceive that to be a proper object for their contemplation, while enquiries into the nature of language are ſuppoſed to be beneath the concern of their exalted underſtanding." We ſhall now quote Dr. Enfield's opinion of this great work. "Diſcarding," ſays he, "all ſyſtematic theories, he has, from actual experience and obſervation, delineated the features, and deſcribed the operations of the human mind, with a degree of preciſion and minuteneſs not to be found in Plato, Ariſtotle, or Des Cartes. After clearing the way by ſetting aſide the whole doctrine of innate notions, and principles both ſpeculative and practical, the author traces all ideas to two ſources, ſenſation and reflection; treats at large of the nature of ideas, ſimple and complex; of the operation of the human underſtanding in forming, diſtinguiſhing, compounding, and aſſociating them; of the manner in which words are applied as repreſentations of ideas; of the difficulties and obſtructions in the ſearch after truth, which ariſe from the imperfection of theſe ſigns; and of the nature, reality, kinds, degrees, caſual hindrances, and neceſſary limits of human knowledge." Mr. Locke's "Two Treatiſes of Government," will render his memory dear to the enlightened friends of civil and religious freedom: his letters on toleration, and his commentaries on St. Paul's epiſtles, are likewiſe held in high eſtimation.

Mr. Locke's private character cannot be wholly overlooked: he poſſeſſed a great knowledge of the world, and was intimately converſant in the buſineſs of it. He was prudent without cunning, and he engaged men's eſteem by his probity. Averſe from all mean compliances, his wiſdom, his experience, and his gentle manners, gained him the reſpect of his inferiors, the eſteem of his equals, the friendſhip and confidence of thoſe of higher quality. He was remarkable for the eaſe and politeneſs of his behaviour; and thoſe who only knew him by his writings, and who had conceived him to be a reſerved man, were ſurpriſed, if they happened to be introduced to him, to find him extremely affable, good-humoured, and complaiſant. Dr. Iſaac Watts deſcribes him as having a ſoul wide as the ſea; calm as night, bright as day. And the ſame author has a fine ode in his lyric poems, written on occaſion of Mr. Locke's dangerous illneſs, ſome time after he had retired to ſtudy the ſcriptures, of which we ſhall quote the firſt ſtanza.

"And muſt the man of wondrous mind,
Now his rich thoughts are juſt refin'd,
Forſake our longing eyes?
Reaſon at length ſubmits to wear
The wings of faith; and lo! they rear
Her chariot high, and nobly bear
Her prophet to the ſkies."

Among the honours paid to the memory of Mr. Locke, that of queen Caroline, conſort of George II. ought not to be overlooked, for that princeſs, having erected a pavilion in Richmond park, devoted to, or in honour of, philoſophy, placed in it Mr. Locke's buſt, with thoſe of Bacon, Newton, and Clarke, as the four chief of the Engliſh philoſophers. He left behind him ſeveral MSS., from which his executors, ſir Peter King and Anthony Collins, eſq. publiſhed, in 1705, his paraphraſe and notes upon St. Paul's epiſtle to the Galatians, which were ſoon followed by thoſe upon the Corinthians, Romans, and Epheſians, with an eſſay prefixed, "For the underſtanding of St. Paul's epiſtles, by conſulting St. Paul himſelf." In the following year the poſthumous works of Mr. Locke were publiſhed, compriſing a treatiſe "On the Conduct of the Underſtanding," intended as a ſupplement to the "Eſſay:" "An Examination of Malebranche's Opinion of ſeeing all Things in God." In 1708, ſome familiar letters between Mr. Locke and ſeveral of his friends were publiſhed. All the works of this great man have been collected, and frequently reprinted in different ſizes; in three vols. folio, in four volumes quarto, and lately in ten volumes 8vo. Biog. Brit. Life prefixed to Mr. Locke's works. Enfield's Hiſt. of Phil.

Locke, in *Geography*, a town of Pruſſia, in Ermeland; 11 miles from Heilſberg.

Locke, a military town of America, in Milton townſhip, New York, in Onondago county; 13 miles N.E. of the S. end of Cayuga lake.

LOCKENITZ, a town and caſtle of Brandenburg, in the Ucker Mark; 16 miles N.E. of Prentzlow.

LOCKER, in a *Ship*, a kind of box or cheſt made along the ſide of a ſhip, to put or ſtow any thing in.

Locker, *Gowlans*. See Hellebore, and Trollius.

Locker, *Shot*, in *Sea Language*. See Garland.

LOCKERBIE, in *Geography*, a market town ſituated in the pariſh of Dryſdale, Dumfriesſhire, Scotland. It is pleaſantly ſeated on the river Annan, at the diſtance of 12 miles from the county town. It conſiſts chiefly of one regular ſtreet, half a mile in length from north to ſouth, and this is interſected, at right angles, by another ſtreet of inferior extent. According to the parliamentary returns of 1801, the whole pariſh contained 322 houſes and 1607 inhabitants. The buildings in the town are chiefly of recent date. The pariſh church ſtands on an eminence at the head of the principal ſtreet. Two lakes formerly almoſt encircled the town. It has two fairs and ten markets during the year, at which upwards of 20,000 lambs are annually ſold; the greater part of which are principally ſent into England. A conſiderable quantity of linen and woollen cloths are likewiſe purchaſed for the ſame part of the kingdom.

LOCKEREN, a town of France, in the department of the Scheldt, and chief place of a canton, in the diſtrict of Termoude. The place contains 11,941, and the canton 15,693 inhabitants, on a territory of 70 kiliometres, in three communes.

LOCKHART, a town of North Carolina, in Albemarle Sound; 38 miles E.S.E. of Halifax. N. lat. 36° 2′. W. long. 76 56′.

LOCKI, or Laki, as the ſame orthography may be almoſt indifferently pronounced, is a name of Lakſhmi, the conſort of the Hindoo deity Viſhnu. See Lakshmi.

LOCKING-up, or Locking-*down*, denotes the operation of paſſing boats up or down through locks.

Locking *of Wheels*, in *Rural Economy*, the means of faſtening them ſo as to prevent their running too ſwiftly upon the horſes, when coming down ſteep hills. This is effected in various ways; as by chains, ſledges, friction, bars, &c. See Cart, Wheel, and Waggon.

LOCKMAN, in the Iſle of Man, the officer who executes the orders of the government, much like our under-ſheriff.

LOCKS, in the *Manege*, in French called *entravons*, are pieces of leather two fingers broad, turned round, and ſtuffed on the inſide, to prevent their hurting the paſtern of a horſe, round which they are clapped. An *entrance* is compoſed of two *entravons* joined by an iron chain, ſeven or eight inches long.

LOCKSPIT, among *Miners*, is the ſmall cut or trench, made with a ſpace of about a foot wide, to mark out the firſt lines of a work.

LOCKTEWACKI, in *Geography*, a town of Swediſh Lapland, on a lake; 65 miles W.N.W. of Pitea.

LOCLE, a town, or rather village, of Switzerland, in the principality of Neufchatel. La Chaux de Fond, another large handſome village lying in a broad valley which reaches to Franche Comte, is connected with Locle by a range of pleaſing cottages, ſkirting both ſides of the road. Both theſe villages, together with the diſtricts belonging to them, contain about 6000 inhabitants, diſtinguiſhed for their ſkill and induſtry in the mechanical arts. They carry on an extenſive traffic in lace, ſtockings, cutlery, and other articles of their own manufacture; but particularly excel in watch-making, and every branch of clock-work. All ſorts of workmen neceſſary for the completion of that buſineſs, ſuch as painters, enamellers, engravers, and gilders, are found in theſe villages; where, upon an average, about 40,000 watches are annually made. Several inhabitants of theſe villages have invented uſeful mathematical and aſtronomical inſtruments. The ſon of Droz, afterwards a reſident at Paris, exhibited in England ſeveral automatical figures of ſurpriſing conſtruction: one played upon the harpſichord, another drew landſcapes, and a third copied any word preſented to it, or wrote down whatever was dictated by any of the company.

LOCMAN, a mountain of Perſia, in the province of Khoraſan; 15 miles W. of Maruerrud.

LOCMINE', a town of France, in the department of Morbihan, and chief place of a canton, in the diſtrict of Pontivy; 10 miles S. of Pontivy. The place contains 9429, and the canton 11,233 inhabitants, on a territory of 180 kiliometres, in ſeven communes.

LOCO Rotondo, a town of Naples, in the province of Bari; 11 miles S.S.E. of Monopoli.

LOCONTAI, a town of Upper Siam; 60 miles N. of Perſelon.

LOCRI, Locrians, in *Ancient Geography*, a people who are ſaid to have derived their name from an ancient hero called "Locris," or "Locros," whoſe ſon Opus founded a town under his own name. Theſe people formed four diſtinct diviſions, with appropriate ſurnames, the three firſt of which, *viz.* Locri *ozoli*, Locri *epicnemidii*, and Locri *opuntiani*, were ſettled in Greece: the fourth diviſion, denominated *epizephyrii*, inhabited Magna Græcia, near the promontory of Zephyrium. The *ozoli* occupied a conſiderable extent of country W. of the Phocide, along the gulf of Corinth. The *epicnemidii* derived their name from mount Cnemis, about which they dwelt; the Maliac gulf being on the E., mount Oeta on the N., the Phocide on the W., and the Locri opuntiani on the S., whoſe territory was of ſmall extent. The *epizephyrii* were ſituated near the promontory of Zephyrium, and were diſtributed into two claſſes, diſtinguiſhed by their name and their ſituation. One diviſion embarked on the gulf of Corinth, and the other on the Ægean ſea. It is therefore poſſible that a colony of one of theſe branches might eſtabliſh themſelves in this part of Italy. Their town, "Locri Epizephyrii," was ſituated on a hill near the abovementioned promontory. Some ſay that it was founded at the ſame time with Cyzicus, under the reign of Tullus Hoſtilius, but Strabo dates its origin a little after Crotona and Syracuſe, about the year 757 before our era. It was very flouriſhing, when Dionyſius the younger, having been driven from Syracuſe, practiſed there all ſorts of violence. But the Locrians, having recovered their liberty, expelled the garriſon and took ample vengeance of the tyrant. Epherus, ſays Strabo, reports, that Zaleucus formed the laws of the Locrians from thoſe of Crete, Sparta, and Athens, one of which eſtabliſhed a conformity of puniſhment to crimes, whereas before they were arbitrary and depended upon the will of the judge. The Locrians had built upon the coaſt a temple of Proſerpine, which was pillaged by Pyrrhus when he carried his arms into Italy. The town was not better treated by the Roman garriſon, under the orders of Flaminius. In the year 539 of Rome the Locrians, having devoted themſelves to the Brutians and Carthaginians, by this conduct incenſed the Roman republic; ſo that they ſent troops againſt them and took their city in the year 549. A little after, however, they recovered their liberty. The ſequel of the hiſtory of the Locrians is not known; but an inſtance of their valour has been recorded which deſerves to be mentioned. In a war between them and the Crotoniates, 10,000 Locrians, with a few additional troops, defeated 130,000 of the enemy near the river Sagra; an event ſo marvellous, that it became proverbial in giving atteſtation to a fact thought incredible. Αλεθεςρα των επι Σαγρα; *i. e.* it is more true than the battle of Sagra.

Locri, or *Locres*, *Motta di Buzzano*, a town of Italy, in Brutium. It was founded, as we have already mentioned in the preceding article, by a colony of Greeks called Locrians.

LOCRIAN, in *Ancient Muſic*, the ſeventh ſpecies of the diapaſon. It was alſo called *hypodorian*, and *common*.

LOCULAMENTUM, in *Botany*, denotes a cell or partition, in a ſeed-pod, for the ſeed of a plant.

In ſome plants we only find one loculamentum in a pod; in ſome others two, three, or more.

LOCUS, Place, in the general ſenſe. See Place.

Locus, among *Ancient Muſicians*, was uſed to ſignify the interval between one degree of acuteneſs or gravity of ſound and another. The Greeks uſed the word τοπος in the ſame ſenſe, for the ſpace through which the voice moved. See Motion.

This motion the Greeks diſtinguiſhed into two kinds; one continued, συνεχη, the other disjunct, διαςηματικη. Inſtances of the firſt kind are in ſpeaking; of the ſecond, in ſinging; and this they called melodic motion, or what was adapted to ſinging. Ptolemy in like manner divides ſounds of unequal pitch, ψοφος ἀνισοτονος, into continued and diſcrete, and ſays the firſt kind are improper, and the ſecond proper, for harmony.

Ariſtides Quintilianus interpoſes a third kind of motion between the two here mentioned, ſuch as that of a perſon reciting a poem.

Locus, in *Rhetoric*, a topic, or head, whence arguments are brought to prove the queſtion in hand. Some of theſe are called *loci communes*, or common topics, as being common to all ſorts of argument; thus, whether a thing be poſſible or impoſſible, more or leſs than ſomething elſe, &c.

Beſides theſe, three others are mentioned by rhetoricians, *juſtum*, *utile*, and *honeſtum*; to which ſome add *jucundum*; but Voſſius will have this laſt to be comprehended under *utile*. See Topic.

Locus *geometricus* denotes a line, by which a local or indeterminate problem is ſolved. See Local *Problem.*

If a point vary its poſition, according to ſome determinate law, it will deſcribe a line, which is called its *locus*: or a locus is a line, any point of which may equally ſolve an indeterminate problem.

This, if a right line ſuffice for the conſtruction of the equation, is called *locus ad rectum*; if a circle, *locus ad circulum*; if a parabola, *locus ad parabolam*; if an ellipſis, *locus ad ellipſim*; and ſo of the reſt of the conic ſections.

The loci of ſuch equations as are right lines, or circles, the ancients called *plane* loci; and of thoſe that are parabolas, hyperbolas, &c. *ſolid* loci.

Apollonius of Perga wrote two books on *plane loci*, in which the object was, to find the conditions under which a point, varying in its poſition, is yet limited to have a right line, or a circle given in poſition. Theſe books are loſt, but attempts have been made at reſtorations by Schooten, Fermat, and R. Simſon; the treatiſe "De Locis Planis," of the latter geometer, publiſhed at Glaſgow, 1749, is a very excellent performance, in all reſpects worthy of its celebrated author. Beſides the above-mentioned writers, the doctrine of loci has been treated of by various other mathematicians, as Craig, Maclaurin, Des Cartes, De l'Hôpital, &c. the latter of whom has two chapters on this ſubject in his Conic Sections. Leſlie in his Geometry has alſo a chapter on plane loci, which contains ſeveral of the moſt ſimple and intereſting propoſitions of this kind.

Before we proceed to inveſtigate the loci of the higher orders, it will be proper to ſtate a few of the principal properties and uſes of plane or geometrical loci; in doing which, however, we muſt neceſſarily confine ourſelves to thoſe only of the moſt general deſcription, as the limits of this article will not admit of a minute and particular inveſtigation.

Prop. I.

If a ſtraight line, drawn through a given point to a ſtraight line given in poſition, be divided in a given ratio, the locus of the point of ſection is a right line given in poſition. *Plate* XII. *Analyſis, fig.* 1.

Let the point A, and the ſtraight line B D, be given in poſition, and let A B, limited by theſe, be cut in a given ratio at C; this point will be in a ſtraight line given in poſition.

Analyſis.—From A, let fall the perpendicular A D upon B D; and through C draw C E parallel to B D; then A C : A B : : A E : A D, and, conſequently, the ratio of A E to A D is given; but A D is given both in poſition and magnitude, and hence A E and the point E are alſo given, and therefore C E, which is perpendicular to A D, is given in poſition.

Compoſition.—Let fall the perpendicular A D, which divides E in the given ratio, and erect the perpendicular C E, ſo ſhall this ſtraight line be the locus required. For C E being parallel to B D, A C : A B : : A E : A D; that is, in the given ratio.

Prop. II.

If a ſtraight line, drawn through a given point to the circumference of a given circle, be divided in a given ratio, the locus of the point of ſection will alſo be the circumference of a given circle. *Fig.* 2.

Let A B, terminating in a given circumference, be cut in a given ratio, the ſegment A C will likewiſe terminate in a given circumference.

Analyſis.—Join A with D, the centre of the given circle; and draw C E parallel to B D; then it is evident that A C : A B : : A E : A D; whence the ratio of A E to A D being given, A E and the point E are given. Again, ſince A C : A B : : C E : B D, the ratio of C E to B D is given, and conſequently C E is given in magnitude. Wherefore the one extremity E being given, the other extremity of C E muſt trace the circumference of a given circle.

Compoſition.—Join A D, and divide it at E in the given ratio, and in the ſame ratio make D B to the radius E C, with which and from the centre E deſcribe a circle.

For draw A B cutting both circumferences, and join C E and B D. Becauſe C E : B D : : A E : A D, alternately C E : A E : : B D : A D; wherefore the triangles C A E and B A D, having likewiſe a common angle, are ſimilar; and conſequently, A C : C B : : A E : A D, that is, in the given ratio.

Prop. III.

If through a given point two ſtraight lines be drawn in a given ratio, and containing a given angle; ſhould the one terminate in a given circumference, the other will alſo terminate in a given circumference. *Fig.* 3.

Let the angle C A B, its vertex A, and the ratio of its ſides be given; if A B be limited by a given circle, the locus of C will alſo be a given circle.

Analyſis.—Join A with D, the centre of the given circle; draw A E at the given angle with A D, and in the given ratio; and join D B and E C. Becauſe the point A and the centre D are given, the ſtraight line A D is given; and ſince the angle D A E, being equal to B A C, is given; A E is given in poſition. But A D being to A E in the given ratio, A E muſt be given alſo in magnitude, and conſequently the point E is given. Again, the whole angle B A C being equal to D A E, the part B A D is equal to C A E, and becauſe A B : A C : : A D : A E, alternately A B : A D : : A C : A E; wherefore the triangles A D B and A E C are ſimilar, and hence A B : B D : : A C : C E, or alternately, A B : A C : : B D : C E; conſequently the fourth term C E is given in magnitude; and its extremity E being given, the other muſt lie in a given circumference.

Compoſition.—Having drawn A E at the given angle with A D, make A D to A E in the given ratio; and in the ſame ratio let D B be made to E C; a circle deſcribed from the centre E with the diſtance E C is the locus required.

For A D : A E : : D B : E C, and alternately, A D : D B : : A E : E C. But the angle B A D is equal to C A E; becauſe the whole B A C is equal to D A E; conſequently the triangles A B D and A C E are ſimilar; and A B : A D : : A C : A E, or alternately, A B : A C : : A D : A E; that is, in the given ratio.

Prop. IV.

The middle point of a given ſtraight line, which is placed between the ſides of a right angle, lies in the circumference of a given circle. *Fig.* 4.

Let A D be placed in the right angle E D F, touching E D and D B, the locus of its biſection C is a given circle.

Analyſis.—Join D C; then becauſe the baſe of the triangle A D B is biſected in C, a circle deſcribed from C as a centre, and with the radius A C, or C B, will paſs through the point D; for the angle A D B being a right angle, it neceſſarily falls in the circumference of the ſemicircle A D E ; conſequently A C, C B and C D, are all equal to each other. But A C, being half of A B, is given, therefore D C is alſo given, whence the locus of the point of biſection C is a circle deſcribed from D with the radius D C.

Compoſition.—From D, with a diſtance equal to half the given line, deſcribe a circle ; this is the locus required.

For draw the radius D C, make $AC = DC$, and produce A C to B. Becauſe $AC = DC$, the angle $ADC = DAC$; but the angles D A C and D B C are together equal to a right angle, and therefore equal to A D C and B D C ; whence the angle D B C is equal to the angle B D C, and, conſequently, the ſide D C is equal to B C. The ſegments A C, B C are thus each of them equal to D C, and hence A B is itſelf double D C, or is equal to the given ſtraight line.

Prop. V.

If from two given points there be inflected two ſtraight lines in a given unequal ratio, the locus of their point of concourſe is a given circle.

Let A C and B C, drawn from the points A and B, have a given ratio, but not that of equality ; then will C, the point of concourſe, lie in the circumference of a given circle. *Fig.* 5.

Analyſis.—Draw C D, making the angle B C D equal to B A C ; and meeting A B produced in D. The triangles D A C and D C B, having the angle at D common, and the angles at A and C equal, are evidently ſimilar ; and hence $AD : AC :: CD : CB$, and alternately, $AD : CD :: AC : CB$, that is, in the given ratio ; but $AD : CD :: CD : BD$, and conſequently, A D is to B D in the duplicate of the given ratio A D to C D, and which is therefore likewiſe given. Conſequently B D, and the point D, are given ; and B D being thence given, its extremity C muſt lie in the circumference of a circle deſcribed with that radius.

Compoſition.—Divide A B in the given ratio in E, and in the ſame ratio make E D to B D ; the circle deſcribed from the centre D, and with the radius D E, is the locus required.

For ſince $AE : EB :: ED : BD$, it follows that $AD : ED :: CD : ED$, or as $CD : BD$; hence the triangles D A C and D C B, thus having their ſides, which contain their common angle D, proportional, are ſimilar ; and therefore $AC : AD :: BC : CD$, or alternately, $AC : BC :: AD : CD$ or D E, that is, in the given ratio.

Prop. VI.

If two ſtraight lines, containing a given rectangle, be drawn from a given point at a given angle ; ſhould the one terminate in a ſtraight line given in poſition, the other will terminate in the circumference of a given circle. *Fig.* 6.

Let the point A, the angle B A C, and the rectangle under its ſides B A, A C, be given ; if the direction B D be given, then will the locus of C be a given circle.

Analyſis.—From A let fall the perpendicular A D upon B D ; draw A E, to contain with A D an angle equal to the given angle, and a rectangle equal to the given ſpace, and join C E.

Since A D is evidently given in poſition and magnitude, A E is likewiſe given in poſition and magnitude ; and the rectangle $AD \times AE$ being equal to $AB \times AC$, therefore $AD : AB :: AC : AE$; but the angle D A E is equal to B A C, and hence D A B is equal to E A C. Wherefore the triangles A B D, A E C, having each an equal angle, and the ſides containing it proportional, are ſimilar ; and conſequently the angle A C E is equal to the right angle A D B. Whence the locus C is a circle, having A E for its diameter.

Compoſition.—Having let fall the perpendicular A D, draw A E, making the angle D A E equal to the given angle, and the rectangles D A, A E, equal to the given ſpace. On A E as a diameter deſcribe a circle ; this is the locus required. For join C E, and the triangles D A B, E A C, being right-angled at D and C, and having the vertical angles at A equal, are evidently ſimilar ; and conſequently $AD : AB :: AC : AE$; and hence the rectangle $AB \times AC = AD \times AE$, that is, it is equal to the given ſpace.

The foregoing propoſition we have drawn with little variation from the chapter on loci given by profeſſor Leſlie in his Geometry, and ſeveral of the following propoſitions are likewiſe derived from the ſame ſource.

7. If a ſtraight line drawn from a given point to a ſtraight line given in poſition, contain a given rectangle, the locus of its point of ſection will be a given circle.

8. If two ſtraight lines in a given ratio, and containing a given angle, terminate in two diverging lines, which are given in poſition, the locus of their vertex will likewiſe be a right line given in poſition.

9. If from two points there be drawn two ſtraight lines, of whoſe ſquares the difference is given, the locus of their point of concourſe will be a right line given in poſition : or, which is the ſame, if the baſe of a triangle, and the difference of the ſquares of the two ſides be given, the vertex of the triangle will fall in a right line given in poſition.

10. If the baſe and vertical angle of a triangle be given, the locus of its vertex will be the circumference of a given circle.

11. If the difference of the ſides, and the radius of the inſcribed circle of a triangle be given, the locus of its vertex is a right line given in poſition.

12. If two given unequal perpendiculars be drawn to a right line given in poſition, and their oppoſite extremities be joined, the locus of the point of interſection will be a right line given in poſition.

13. If in any triangle the baſe be given, and the ſum of the ſquares of the other two ſides, the locus of the vertex is a given circumference.

14. If from given points there be drawn ſtraight lines, whoſe ſquares are together equal to a given ſpace, their point of concourſe will terminate in the circumference of a given circle.

15. If right lines be drawn from a given point to cut a given circle, and from the points of interſection there be taken, upon theſe lines, on either ſide, lines in a conſtant given ratio to the diſtance between the reſpective points of interſection and the given point ; the locus of the points, ſo determined, will be a circle.

16. If two circles cut each other, and through either point of interſection a right line be drawn, cutting both the circles, then, if a right line be always taken thereon from one of thoſe points in a given ratio to the part intercepted between the circles, the locus of the points ſo determined will be a circle.

17. If the circles cut each other as above, and a right line be drawn through either interſection, cutting both the circles, then if a right line be always taken thereon from one of thoſe points in a given ratio to the part between the other point and interſection, the locus of the point ſo determined will be a circle.

18. If triangles be inſcribed in a given ſegment of a circle, and from the vertex on either ſide (produced if neceſſary) there be taken, either way, a right line always in a conſtant ratio to either of the ſides, or to their ſum, or difference, the loci of the points ſo deſcribed will be circles.

The above contain many of the moſt ſimple caſes of geometrical loci; and we will now ſhew the application of them to the conſtruction of certain geometrical problems.

Of the Conſtruction of geometrical Problems.

Prob. I.

Having given the baſe, perpendicular, and vertical angle of a plane triangle; it is required to conſtruct it. *Fig.* 7.

Analyſis.—Suppoſe the thing done, and let A B C repreſent the propoſed triangle, of which the baſe A B, the perpendicular C D, and vertical angle A C B, are given; then it is obvious, in the firſt place, that the locus of the vertex will be the right line C F, drawn parallel to A B, at the given perpendicular diſtance. Alſo, ſince the angle A C B is given, the locus of the vertex will be in the circumference of the circle A C B, deſcribed upon A B, capable of containing the given angle A C B; and conſequently, at either point where the line and circle interſect each other, will be the vertex of the triangle required.

Conſtruction.—On the given baſe A B deſcribe a circle that ſhall contain the given vertical angle. And parallel to A B, and at a diſtance equal to the given perpendicular, draw the right line F C E; join A C, C B, ſo is A C B the triangle required. For, the point C being in the ſegment A C B, the angle A C B is equal to the given vertical angle; and being alſo in the line F C E, the perpendicular C D is equal to the given perpendicular, and the baſe A B is equal to the given baſe.

If the right line cut the circle in one point, it will alſo cut it in two points, and therefore in this caſe there are two triangles which anſwer the conditions of the problem; but if it touches the circle only, then there is but one ſuch triangle; and if the line F C E falls above the circle, then the problem is impoſſible.

Prob. II.

Having given the perimeter of a right-angled triangle, and the perpendicular let fall from the right angle to the oppoſite ſide, to conſtruct it. *Fig.* 8.

Analyſis.—Suppoſe the thing done, and let A C B be the propoſed triangle; produce the line A B both ways to D and E, making A D = A C, and C B = B E; then will D E repreſent the perimeter which is given by the queſtion; join D E and C E. Then becauſe D A = A C, the angle A D C = D C A; but the angle C A B is equal to the two angles A D C and D C A, or it is equal to double the angle D C A: in the ſame manner it may be ſhewn that the angle A B C is equal to double the angle B C E; but the angles C A B and A B C are together equal to a right angle, and conſequently, ſince theſe are double of the angles D C A and B C E, it follows, that the ſum of the latter two angles is given, being equal to half a right angle; and therefore alſo the whole angle D C E is given, being equal to a right angle and half a right angle; therefore the locus of the point C is in the circumference of a given circle. And ſince the perpendicular C G is alſo given, the locus of the point C is the right line C F, parallel to the baſe A B, whence the point C is determined, being found in the interſection of the right line C F and the given ſegment D C E.

Conſtruction.—On the right line D E, equal to the given perimeter, deſcribe a ſegment capable of containing an angle equal to a right angle and half a right angle; and parallel to D E, and at the given perpendicular diſtance, draw the right line F C cutting the ſegment in C and C′: join D C, C E; and from C draw alſo C A, A B, making the angles D C A and B C E reſpectively equal to the angles C D A and C E B, ſo ſhall A C B be the triangle required.

For ſince the angle D C A is equal to the angle D A C, the ſide D A is equal to A C, and for the ſame reaſon the ſide C B is equal to B E, and therefore the three ſides of the triangle A B C are equal to the whole D E, or to the given perimeter; alſo, ſince the angle D C E is equal to a right angle and half a right angle, the angles C D A and C E B are together equal to half a right angle; but the angle C A B is double the angle C D A, and the angle C B A is double the angle C E B, and conſequently theſe two together are equal to a right angle; therefore the third angle of the triangle A C B is a right angle. Hence, ſince the perpendicular C G is equal to the given perpendicular, by conſtruction, and the ſum of the three ſides A B, A C, B C, equal to the given perimeter, and the angle A C B equal to the given angle, it follows that the triangle A B C is that which was to be conſtructed.

This conſtruction ſerves equally for any other triangle, provided the vertical angle be given: and the limits of poſſibility are the ſame as in the preceding problem.

We will add one other example from Dr. Pemberton's paper on this ſubject, printed in vol. liii. of the Philoſophical Tranſactions, and will then proceed to the conſideration of loci of the higher orders.

Prob. III.

Let it be propoſed to draw a triangle given in ſpecies, ſo that two of its angles may touch a right line given in poſition, and the third angle a given point.

This problem, which would be extremely difficult to ſolve algebraically, admits of more than one very conciſe geometrical ſolution; and as they will occupy but little ſpace, it is preſumed they will not be unacceptable to the reader of this article.

In the firſt place, ſuppoſe a circle (*fig.* 9.) to paſs through the three points A, E, D, which ſhall interſect A C in G. Then E G, D G, being joined, the angle D E G will be equal to the given angle D A C, both inſiſting on the ſame arc D G: alſo the angle E D G is the complement to the two right ones of the given angle B A C: theſe angles therefore are given, and the whole figure E F G D given in ſpecies. Conſequently the angle E G F, and its equal A D E will be given, together with the ſide D E of the triangle in poſition.

Again, ſuppoſe a circle (*fig.* 10.) to paſs through the three points A, E, F, cutting A D in H, and E H, F H joined. Here the angle E F H will be equal to the given angle E A H; and the angle F E H equal to the given angle F A H. Therefore the whole figure E H F D is given in ſpecies; and conſequently the angle A D E as before.

Laſtly, ſuppoſe a circle (*fig.* 11.) to circumſcribe the triangle, and interſect one of the lines, as A C in I. Then D I being drawn, the angle D I F will be equal to the given angle D E F in the triangle; conſequently D I is inclined to A C in a given angle, and is given in poſition, as alſo the point I given; whence I E being drawn, the angle F I E will be the complement of the angle E D F in the triangle to two right ones. Therefore I E is given in poſition, and by its interſection with the line A B, gives the point E, with the poſition of D E, and thence the whole triangle as before. Here it may be obſerved, that the angle D of the triangle E D F, given in ſpecies touching a given point D, and another of its angles touching A C, the line A E here found is the locus of the third angle E.

Of the higher Order of Loci.

Loci are very commodiouſly divided into orders, according to the dimenſions to which the variable quantity riſes in the formula which expreſſes the equation of the curve.

Thus it will be a *locus of the firſt order*, if the equation be $x = a y$; a *locus of the ſecond* or quadrate order, if $y^2 = a x$, or $y^2 = a^2 - x^2$, &c.; a *locus of the third* or cubic order, if $y^3 = a^2 x$, or $y^3 = a x^2 - x^3$, &c.

The better to conceive the nature of the locus, ſuppoſe two unknown and variable right lines A P, P M (*figs.* 12 and 13.) making any given angle A P M with each other; the one whereof, as A P, we call x, having a fixed origin in the point A, and extending itſelf indefinitely along a right line given in poſition; the other P M, which we call y, continually changing its poſition, but always parallel to itſelf; and moreover an equation only containing theſe two unknown quantities x and y, mixed with known ones, which expreſſes the relation of every variable quantity A P (x) to its correſpondent variable quantity P M (y): the line paſſing through the extremities of all the values of y, *i. e.* through all the points M, is called a geometrical locus, in general, and the locus of that equation in particular.

All equations, whoſe loci are of the *firſt order*, may be reduced to ſome one of the four following formulæ:

$$1 \cdot y = \frac{b x}{a},\ 2 \cdot y = \frac{b x}{a} + c \cdot 3 \cdot y = \frac{b x}{a} - c \cdot 4 \quad y = c - \frac{b x}{a},$$

where the unknown quantity y is ſuppoſed always to be freed from fractions, and the fraction that multiplies the other unknown quantity x to be reduced to this expreſſion $\frac{b}{a}$, and all the known terms to this c.

The locus of the firſt formula being already determined; ſince it is evident, that it is a right line which cuts the axis in A, and which makes with it an angle, ſuch that the two unknown quantities x, y, may be always to one another in the proportion of a to b; to find that of the ſecond, $y = \frac{b x}{a} + c$. In the line A P (*fig.* 14.) take A B $= a$, and draw B E $= b$, A D $= c$, parallel to P M. On the ſame ſide A P, draw the line A E of an indefinite length towards E, and the indefinite ſtraight line D M parallel to A E. I ſay the line D M is the locus of the aforeſaid equation or formula; for if the line M P be drawn from any point M thereof parallel to Q A, the triangles A B E, A P F, will be ſimilar; and therefore A B (a) : B E (b) : : A P (x) : P F $= \frac{b x}{a}$; and conſequently P M (y) $=$ P F $\left(\frac{b x}{a}\right)$ $+$ F M (c).

To find the locus of the third form, $y = \frac{b x}{a} - c$, proceed thus. Aſſume A B $= a$ (*fig.* 15.) and draw the right lines B E $= b$, A D $= c$, parallel to P M, the one on one ſide A P, and the other on the other ſide; and through the points A, E, draw the right line A E of an indefinite length towards E, and through the point D the line D M parallel to A E: I ſay, the indefinite right line G M ſhall be the locus ſought; for we ſhall have always P M (y) $=$ P F $\left(\frac{b x}{a}\right)$ $-$ F M c.

Laſtly, to find the locus of the fourth formula, $y = c - \frac{b x}{a}$; in A P (*fig.* 16.) take A B $= a$, and draw B E $= b$, A D $= c$, parallel to P M, the one on one ſide A P, and the other on the other ſide; and through the points A, E, draw the line A E indefinitely towards E, and through the point D draw the line D M parallel to A E. I ſay D G ſhall be the locus ſought; for if the line M P be drawn from any point M thereof, parallel to A Q, then we ſhall have always P M (y) $=$ F M (c) $-$ P F $\left(\frac{b x}{a}\right)$.

Hence it appears, that all the loci of the *firſt* degree are ſtraight lines; which may be eaſily found, becauſe all their equations may be reduced to ſome one of the foregoing formulæ.

All loci of the *ſecond* degree are conic ſections, *viz.* either the parabola, the circle, ellipſis, or hyperbola: if an equation therefore be given, whoſe locus is of the ſecond degree, and it be required to draw the conic ſection, which is its locus, firſt draw a parabola, ellipſis, and hyperbola; ſo that the equations expreſſing the natures thereof may be as compound as poſſible; in order to get general equations, or formulæ, by examining the peculiar properties whereof we may know which of theſe formulæ the given equation ought to have regard to; that is, which of the conic ſections will be the locus of the propoſed equation. This known, compare all the terms of the propoſed equation with the terms of the general formula of that conic ſection, which you have found will be the locus of the given equation; by which means you will know how to draw the ſection, which is the locus of the equation given.

For example: let A P (x), P M (y), be unknown, and variable ſtraight lines (*fig.* 17.), and let m, n, p, r, s, be given right lines: in the line A P take A B $= m$, and draw B E $= n$, A D $= r$, parallel to P M; and through the point A draw A E $= e$, and through the point D the indefinite right line D G parallel to A E. In D G take D C $= s$, and with C G, as a diameter, having its ordinates parallel to P M, and the line C H $= p$, as the parameter, deſcribe a parabola C M, and it will be the locus of the following general formula:

$$\begin{aligned} y^2 - \frac{2n}{m} x y + \frac{n^2}{m^2} x^2 - 2 r y + \frac{2 n r}{m} x - r^2 &= 0. \\ - \frac{e p}{m} x + p s.& \end{aligned}$$

For if from any point M there be drawn the right line M P, making any angle A P M with A P; the triangles A B E, A P F, ſhall be ſimilar; therefore A B (m) : A E (e) : : A P (x) : A F, or D G $= \frac{e x}{m}$; and A B (m) : B E (x) : : A P (x) : P F $= \frac{n x}{m}$. And conſequently, G M or P M

— P F

$- \text{P F} - \text{F G} = y - \frac{nx}{m} - r$, and C G or D G − D C = $\frac{ex}{m} - s$. But from the nature of the parabola $\text{G M}^2 = \text{C G} \times \text{C H}$; which equation will become that of the general formula, by putting the literal values of thoſe lines.

Again: if through the fixed point A you draw the indefinite right line A Q (*fig.* 18.) parallel to P M, and take A B = m, and draw B E = n, parallel to A P, and through the determinate points A E, the line A E = e; and if in A P you take A D = r, and draw the indefinite ſtraight line D G parallel to A E, and take D C = s; this being done, if with the diameter C G, whoſe ordinates are parallel to A P, and parameter the line C H = p, you deſcribe a parabola C M; this parabola ſhall be the locus of this ſecond equation, or formula:

$$x^2 - \frac{2n}{m} y x + \frac{n^2}{m^2} y^2 - 2 r x + \frac{2nr}{m} y + r^2 = 0.$$

$$- \frac{ep}{m} y + ps.$$

For if the line M Q be drawn from any point M, therein, parallel to A P; then will A B (m) : A E (e) : : A Q or P M (y) : A F or D G = $\frac{ey}{m}$. And A B (m) : B E (n) : : A Q (y) : Q F = $\frac{ny}{m}$. And therefore G M or Q M − Q F − F G = $x - \frac{ny}{m} - r$; and C G or D G − D C = $\frac{ey}{m} - s$. And ſo by the common property of the parabola, you will have the foregoing ſecond equation, or formula. So likewiſe may be found general equations, or formulæ, to the other conic ſections.

Now if it be required to draw the parabola, which we find to be the locus of this propoſed equation $y^2 - 2ay - bx + c^2 = 0$; compare every term of the firſt formula with the terms of the equation, becauſe y^2 in both is without fractions; and then will $\frac{2n}{m} = 0$, becauſe the rectangle xy not being in the propoſed equation, the ſaid rectangle may be eſteemed as multiplied by 0; whence $n = 0$, and $m = e$; becauſe the line A E falling in A B, that is, in A P in the conſtruction of the formula, the points B, E, do coincide. Therefore, deſtroying all the terms affected with $\frac{n}{m}$ in the formula, and ſubſtituting m for e, we ſhall get $y^2 - 2ry - px + r^2 + ps = 0$.

Again, by comparing the correſpondent terms $-2ry$, and $-2ay$, as alſo $-px$, and $-bx$, we have $r = a$, and $p = b$; and comparing the terms wherein are neither of the unknown quantities x, y, we get $r^2 + ps = c^2$; and ſubſtituting a and b for r and p, then will $s = \frac{c^2 - a^2}{b}$, which is a negative expreſſion, when a is greater than c, as is here ſuppoſed. There is no need of comparing the firſt terms y^2 and y^2, becauſe they are the very ſame. Now the values of m, n, r, p, s, being thus found, the ſought locus may be conſtructed by means of the conſtruction of the formula, and after the following manner.

Becauſe B E (n) = 0 (*fig.* 19.) the points B, E, do coincide, and the line A E falls in A P; therefore through the fixed point A draw the line A D $r = a$ parallel to P M, and draw D G parallel to A P, in which take D C (s) = $\frac{a^2 - c^2}{b}$; then with D C, as a diameter, whoſe ordinates are right lines parallel to P M, and parameter the line C H (p) = b, deſcribe a parabola: I ſay, this will be the locus of the given equation, as is eaſily proved. If in a given equation, whoſe locus is a parabola, x^2 be without a fraction; then the terms of the ſecond formula muſt be compared with thoſe of the given equation.

Thus much for the method of conſtructing the loci of equations which are conic ſections. If, now, an equation, whoſe locus is a conic ſection, be given, and the particular ſection whereof it is the locus, be required:

All the terms of the given equation being brought over to one ſide, ſo that the other be equal to 0, there will be two caſes.

Caſe 1. When the rectangle xy is not in the given equation. 1. If either y^2 or x^2 be in the ſame equation, the locus will be a parabola. 2. If both x^2 and y^2 are in the equation with the ſame ſigns, the locus will be an ellipſis, or a circle. 3. If x^2 and y^2 have different ſigns, the locus will be an hyperbola, or the oppoſite ſections regarding their diameters.

Caſe 2. When the rectangle xy is in the given equation. 1. If neither of the ſquares x^2 or y^2, or only one of them, be in the ſame, the locus of it will be an hyperbola between the aſymptotes. 2. If y^2 and x^2 be therein, having different ſigns, the locus will be an hyperbola, regarding its diameters. 3. If both the ſquares x^2 and y^2 are in the equation, having the ſame ſigns, then, according as the co-efficient of x^2 is greater, equal or leſs than the ſquare of half the co-efficient of xy, the locus ſhall be an ellipſe, parabola, or hyperbola. And in any caſe the locus of the equation is ſome conic ſection.

We will add a problem or two, by way of illuſtration, with which we muſt conclude this article.

Problem I.

If A B be the axis of a conic ſection, from B draw B D to meet the curve in D; and erect D C perpendicular to A B, and produce it from C till C P is in a given ratio to B D; the locus of the point P will be a conic ſection.

1. For the ellipſe (*fig.* 20.); put the axis A B = a, and its conjugate Q O E = b, B C = x, and the ratio B D : C P : : $d : a$. Then by the known property of the ellipſe,

$$a^2 : b^2 : : ax - x^2 : \text{C D}^2 = \frac{b^2}{a^2}(ax - x^2);$$

conſequently, $\text{B D}^2 = \frac{b^2 ax}{a^2} - \frac{b^2}{a^2}x^2 + x^2 = \frac{b^2 ax}{a^2} + \frac{a^2 - b^2}{a^2}x^2$, and, therefore, $\text{C P}^2 = \frac{a^2}{d^2} + \text{B D}^2 = \frac{b^2 ax + (a^2 - b^2)x^2}{d^2} = \frac{a^2 - b^2}{d^2}\left(\frac{b^2 a}{a^2 - b^2}x - x^2\right)$, which, if a be greater than b, is an equation to the hyperbola, the axes of which are $\frac{b^2 a}{a^2 - b^2}$ and $\frac{b^2 a}{d\sqrt{(a^2 - b^2)}}$.

And if b be greater than a, the equation becomes

$$C\,P^2 = \frac{b^2 a x - (b^2 - a^2)\,x^2}{d^2} =$$

$$\frac{b^2 - a^2}{d^2}\left\{\frac{b^2 a}{b^2 - a^2}\,x - x^2\right\}$$

which is an equation to the ellipſe whoſe axes are

$$\frac{b^2 a}{b^2 - a^2} \text{ and } \frac{b^2}{d\sqrt{(b^2 - a^2)}}.$$

Again, if $b = a$, the ellipſe becomes a circle, and the equation for the value of C P becomes $C\,P^2 = \frac{b^2 a x}{d^2}$, which is an equation to the parabola, whoſe parameter is $\frac{b^2 a}{d^2}$.

1. For the hyperbola (*fig.* 21.); the ſame notation remaining, $D\,C^2 = \frac{b^2}{a^2}\,a x + \frac{b^2}{a^2}\,x^2$ by the property of the curve; conſequently $C\,P^2 = \frac{a^2}{d^2} \times B\,D^2 =$

$$\frac{b^2}{d^2}\,a x + \frac{+b^2}{d^2}\,x^2 =$$

$$\frac{a^2 + b^2}{d^2}\left\{\frac{b^2 a x}{a^2 + b^2} + x^2\right\}$$

which expreſſes an equation to an hyperbola, whoſe axes are $\frac{b^2 a}{a^2 + b^2}$ and $\frac{b^2}{d\sqrt{(a^2 + b^2)}}$.

3. For the parabola (*fig.* 22.); put the parameter $= p$, then $C\,D^2 = p\,x$, and $B\,D^2 = p\,x + x^2$; therefore $C\,P^2 = \frac{a^2}{d^2}(p\,x + x^2)$ the equation to an hyperbola whoſe axes are p and $\frac{a p}{d}$.

Prob. II.

If on any given right line, A B, there be taken any variable diſtance A L, and from L, in the ſame direction, any given invariable diſtance L M; and if with the centres L and B, and radii L A, B M, arcs be deſcribed, it is required to determine the nature of the curve, which is the locus of P, the point of interſection.

Let $A\,B = a$ (*fig.* 23); $L\,M = b$; $B\,M = B\,P = \phi$, and having drawn P O perpendicular to A B, put $B\,O = x$. Then $B\,L = \phi + b$; $L\,O = \phi + b - x$; $L\,P = A\,L = a - b - \phi$; and becauſe $L\,P^2 - L\,O^2 = B\,P^2 - B\,O^2$, we have in ſymbols $(a - b - \phi)^2 - (\phi + b - x)^2 = \phi^2 - x^2$; whence $a^2 - 2\,(a - x)\,b = \phi^2 + 2\,(a - x)\,\phi$; and adding $-\,b^2 + b^2 + (a - x)^2$ to one ſide, and its equal $(a - x)^2$ to the other ſide, there reſults $a^2 - b^2 + (a - b - x)^2 = (a - x + \phi)^2$.

Now take $A\,C = L\,M = b$, draw C D perpendicular to A B, and make $A\,D = A\,B = a$; then $C\,D^2 = a^2 - b^2$; $C\,O^2 = (a - b - x)^2$, and $(O\,A + B\,P)^2 = (a - x + \phi)^2$ whence we have $D\,O = A\,O + P\,B$; or $P\,B = D\,O - A\,O$.

Hence it will be eaſy to derive an algebraical equation for the rectangular co-ordinates of the curve; for we have only to put $P\,O = y$, to ſubſtitute $\sqrt{(x^2 + y^2)}$ for ϕ, and to clear the equation of radicals. The equation thus found will ſhew the curve to be of the fourth order; but the curve and its principal properties may be more readily deduced from the property above inveſtigated; *viz.* $P\,B = D\,O - A\,O$. The curve will conſiſt of two equal and ſimilar parts, lying on different ſides of A B, it will be a ſort of oval, encloſing the point B on every ſide.

The following are ſome of the ſimpleſt caſes of the higher order of loci.

1. The baſe, and ſum of the ſides of a plane triangle being given, the locus of its vertex is an *ellipſe.*

2. The baſe and difference of the ſides of a plane triangle being given, the locus is an *hyperbola.*

3. The locus of that point, from which, if perpendiculars be drawn to three right lines given in poſition, and ſuch that the ſum of their ſquares ſhall be equal to a given ſpace, is an *ellipſe.*

And the ſame is true, whatever be the number of lines given in poſition.

4. If a triangle given in ſpecies have two of its angles upon a ſtraight line given by poſition, and the ſide adjacent to thoſe angles paſſing through a given point, the locus of the angle, oppoſite that ſide, is an *hyperbola.*

5. Let A, B, be two given points in the right line A B, given in poſition; let C, D, be two given points without that line; and alſo let C V, D V, be drawn meeting in F and G, ſo that the rectangle A F × B G is given, the locus of the point will in all caſes be a *conic ſection:*

6. Let A B be a given ſtraight line, and P a given point without it; let C P D be drawn, meeting A B in C; and let C P be to P D as A C to C B; the locus of the point D is a given *hyperbola.*

7. When the baſe of a triangle is given, and one of the angles at the baſe doubles the other, the locus of the vertex is an *hyperbola.*

8. The locus of the angles of parallelograms, formed by drawing tangents at the vertices of any two conjugate diameters of an ellipſe, is alſo an *ellipſe cocentric with the former.*

The above caſes, and ſeveral other curious properties of this kind, the reader will find inveſtigated in Leybourn's "Mathematical Repoſitory."

The method of conſtructing geometrical loci, by reducing them to equations as compound as poſſible, we owe to Mr. Craig, who firſt publiſhed it in his Treatiſe of the Quadrature of Curves, 1693. It is explained at large in the ſeventh and eighth books of the Conic Sections of the marquis de l'Hoſpital. This ſubject is particularly illuſtrated in Maclaurin's Algebra, part iii. See alſo Des Cartes's Geometry; Stirling's Illuſtratio Linearum Tertii Ordinis; De Witt's Elementa Curvarum: Bartholomæus Juliari, in his Aditus ad nova Arcana Geometrica delegenda, has ſhewn how to find the loci of equations of the higher order. See alſo the other writers mentioned in the preceding part of this article.

LOCUST, Locusta, in *Entomology*, a genus of inſects, referred to that of *gryllus;* which ſee.

Under that article the reader will find a particular account of the devaſtations occaſioned by ſwarms of locuſts in their marches, and he will perceive the propriety of the frequent alluſions to them that occur in the ſacred writings. Dr. Shaw, Niebuhr, Ruſſell, and many other travellers into the eaſtern countries, repreſent their taſte as agreeable, and inform us that they are frequently uſed for food. Dr. Shaw obſerves, that when they are ſprinkled with ſalt and fried, they are not unlike, in taſte, to our freſh-water cray-fiſh. Ruſſell ſays, that the Arabs ſalt them, and eat them as a delicacy. We learn alſo from Niebuhr, that they are gathered by the Arabs in great abundance, dried, and kept for winter proviſion. Hence we may naturally ſuppoſe, that theſe locuſts were the food of John the Baptiſt.

Locust, *Water*, *Locuſta Aquatica*, the name given by authors to a ſpecies of water-inſect, ſomewhat reſembling the locuſt kind in ſhape. It is about three inches long, its tail an inch and quarter, and its legs are of different lengths, the anterior part being the ſhorteſt of all; its body is ſlender, and its fore-legs are always carried ſtraight forward, ſo as to reach beyond the head in the form of antennæ; theſe, as well as the other legs, end each in two claws; the eyes are ſmall, and not very prominent, and the upper wings are cruſtaceous; the under ones membranaceous, thin, and tranſparent; the middle joint of the leg is ſuch, that the creature can only move them upwards, not downwards, and there runs an acute tongue or proboſcis under the belly, as is the caſe in the water-ſcorpion and notonecta. See Nepa *Linearis*.

Locust, in *Botany*. See Ceratonia *Siliqua*. See alſo Gleditsia and Hymenæa.

LOCUSTA. See Valeriana.

Locusta-*Pulex*, a name given by Swammerdam to a genus of inſects, deſcribed ſince by Mr. Ray under the name *cicadula*.

LOCUSTÆ is uſed by botaniſts for the tender extremities of the branches of trees; ſuch as, according to the erroneous ſuppoſition of ſome, John the Baptiſt fed on in the wilderneſs.

Some alſo uſed locuſtæ for the beards and pendulous ſeeds of oats, and of the gramina paniculata; to which the name is given on account of their figure, which ſomething reſembles that of a locuſt.

LOCUSTELLA, the *Graſs-hopper Lark*, in *Ornithology*, the name of a ſmall bird of the lark kind, the Alauda *Trivialis* of Linnæus; which ſee.

LOCUTIUS, in *Mythology*, the god of ſpeech among the Romans, called by Livy Aius *Locutius*; which ſee.

LOCUTORIUM. The monks and other religious in monaſteries, after they had dined in their common hall, had a withdrawing room, where they met and talked together among themſelves, which room, for that ſociable uſe and converſation, they called *locutorium*, *a loquendo*; as we call ſuch a place in our houſes parlour, from the French *parler*; and they had another room, which was called *locutorium forinſecum*, where they might talk with laymen.

LODARIA, in *Geography*, a town of Hindooſtan, in Bahar; 24 miles N.N.E. of Hajypour.

LODDIGESIA, in *Botany*, is juſtly devoted by Dr. Sims in Curtis's Magazine, to commemorate the merits of a moſt excellent and ſcientific cultivator of plants, whoſe liberality is equal to his knowledge, Mr. Conrad Loddiges of Hackney. Curt. Mag. v. 24. 965. Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Eſſ. Ch. Standard many times ſmaller than the wings or keel. Filaments all in one ſet, with a dorſal fiſſure. Legume ſtalked, turgid.

1. L. *oxalidifolia*. Oxalis-leaved Loddigeſia. Curt. Mag. t. 965.—The only known ſpecies, a native of the Cape of Good Hope, from whence its ſeeds were firſt received by George Hibbert, eſq. The plant is tolerably hardy in the conſervatory, readily propagated by cuttings, and flowers freely in May and June. Mr. Loddiges himſelf has alſo raiſed it, many years ago, from Cape ſeeds. The *ſtem* is ſhrubby, low, much branched. *Leaves* ſcattered, ſtalked, ternate, inverſely heart-ſhaped, rather glaucous, ſmooth, tipped with a minute point. *Stipulas* intrafoliaceous, ſmall, ſetaceous, deciduous. *Cluſters* terminal, ſomewhat umbellate, of few flowers. *Bracteas* ſmall, ſlender, almoſt capillary. *Calyx* nearly bell-ſhaped, obtuſe at the baſe, coloured, ſmooth, its three lower teeth rather the longeſt. *Standard* white, not twice the length of the calyx. *Wings* and *keel* about thrice as long as the ſtandard, white, the fore part of the keel violet. *Style* bent upward at a right angle. *Stigma* ſimple. *Legume* ſtalked, ovate, oblique, pointed, turgid, ſmooth. *Seeds* about four, kidney-ſhaped.

LODDON, in *Geography*, a ſmall market-town in the hundred to which it gives name, in the county of Norfolk, England, is ſituated 111 miles from London, on the banks of a ſmall ſtream, which, riſing near Howe in Clavering, falls into the Yare at Hardley Croſs. The church, which is a handſome ſtone ſtructure, with a fine tower, was erected near the end of the fifteenth century, at the ſole expence of ſir James Hobart, the attorney-general to king Henry VII., and afterwards chief juſtice of the common pleas, who was a great benefactor to this town and its vicinity. In the church are ſeveral memorials of the Hobart family. In the eaſt window was a piece of ſtained glaſs, now removed, repreſenting ſir James and his lady, with a ſketch of the church, and an appropriate inſcription. Loddon was returned, in the year 1800, as containing 166 houſes and 799 inhabitants. A market is held on Fridays, and two fairs annually. Blomfield's Hiſtory, &c. of Norfolk, 11 vols. 8vo.

LODE, a town of the iſland of Sardinia; 80 miles N. of Cagliari.

Lode, in *Inland Navigation*, ſignifies a cut or reach of water.

Lode, in *Mining*. This word is derived from the Anglo-Saxon, according to Dr. Pryce, and is uſed by the Corniſh miners to deſignate any regular vein, whether metallic or not. More commonly, however, it means a metallic vein.

The lodes that are found to contain tin and copper ores, in Cornwall and Devon, have their general direction in a line running nearly eaſt and weſt; their dip or *underlay* being more commonly to the north; though ſome which incline to the ſouth have been very productive. Veins which interſect the eaſt and weſt lodes are called *croſs-lodes*, or *croſs-courſes*, when their direction is nearly at right angles with the others; and *caunters*, more generally, when their direction is oblique.

The metallic eaſt and weſt lodes are traverſed or diſturbed by the croſs-courſes, and theſe interruptions are known by the name of *heaves*, which take place to very different degrees of extent, and vary much in the circumſtances under which they are found; ſo that miners do not agree upon any certain rules for determining the diſtance or direction of the heave by the accompanying appearances.

Though copper and tin are found but partially in croſs-lodes, yet lead has been raiſed in large quantities from ſome that have nearly a due north and ſouth courſe; ſuch as the Beeralſtone lead-mines and Wheal Betſy lead-mine in Devon. Eaſt and weſt lodes have ſometimes a mixture of lead ores with copper; but this appears to be derived from the interſection of a croſs-courſe, or the effect of a later depoſit. Lodes traverſe all kinds of rock found in the line of their direction, whether vertically or horizontally. Thoſe worked in Cornwall and Devon are chiefly in killas or grauwacke ſlate; but they are ſometimes in granite, and paſs not unfrequently from the former into the latter.

The width of veins varies from an inch or two to fifteen or twenty feet; the latter dimenſion being rare, as the former is unprofitable to follow, unleſs in the expectation of an enlargement. The more common width, or, as the miners call it, *the ſize of lodes*, is from two to four feet; and if ſuch a vein as this be fully impregnated with metal, it is very profitable to work, and is called a good *courſe of ore.* The variations of width take place not only in diſtinct veins, but in one and the ſame; which, together with the fluctuations in the nature of their contents, render their produce ſo uncertain. A large and productive lode often dwindles to a mere *branch*, requiring an experienced eye to diſtinguiſh it from the rock through which it paſſes; and this again expands to a conſiderable ſize, filled with depoſits of various kinds. The width of lodes ſeems often to have a relation to the nature of the rock in which they are found; and changes in the latter appear generally to produce changes in the former. Thus, a vein that is large and productive in ſoft blue killas, will, by paſſing into harder, become leſs in ſize, and barren as to metallic contents. Another lode may be rich in hard ground, but poor and unproductive in that which is of a ſofter kind: but this is not ſo frequent as the former caſe. The depoſits of metal are as irregular in the lodes as the widths of them; and ſo much ſo, as to render the profits of mining proverbially uncertain. Ore is generally found to occupy certain parts of the veins only, differing conſtantly in extent, whether the length or depth on the courſe of the vein be conſidered, or the portion of its width which is filled up by it. No lode has been found regularly impregnated with metal to any great extent; and therefore, when ore is found, it is in what the miners aptly call *bunches* or *ſhoots*. The unproductive parts of veins, even in the moſt profitable mines, generally far exceed in extent the productive parts; but that mine is conſidered to be rich, which has either frequent or extenſive ſhoots of ore: the great art of the miner, therefore, conſiſts in tracing and working the valuable accumulations of the metals with as little waſte of labour and expence on the poorer ground as poſſible.

Although the bunches of ore have no regular form in their vertical or horizontal extent, yet the tendency to a certain direction or dip in the lode may be obſerved in each bunch or ſhoot of ore. Theſe ſhoots are frequently parallel in the ſame vein; and where the dip or underlay of the lode is to the north, the ſhoots of ore may frequently be obſerved to dip weſt in the lode. In veins underlaying ſouth, the bunches of ore frequently have their dip to the eaſt: but this is not to be taken as a general rule, as many mines afford exceptions to it; the underlay of the lode and the dip of the bunches of ore being reverſed.

Theſe tendencies or inclinations of the depoſits of metal in the veins, connected with the ſituations, dips, and bearings of the veins themſelves, ſeem to offer grounds for argument on the diſputed queſtion of the mode in which the metals were depoſited; but they have not much, we believe, attracted the notice of mineralogiſts.

Lodes continue to indefinite lengths, and to unknown depths. It is very difficult to determine whether the end of any regular vein has been found or not; as there are many inſtances of their having become ſo ſmall as to be ſcarcely viſible, and yet afterwards, on purſuing them, to have reſumed their uſual ſize. When a lode has continued ſmall, either in length or depth, to any conſiderable extent, it is moreover uſually abandoned as unpromiſing; and thus complete evidence as to this queſtion is not obtained.

Lodes are perfect in the ſurface of the mountains, as well as in their greater depths; and may be traced uniformly by removing the ſoil with which the rock is covered. This is done conſtantly by the miner when he is about to undertake operations upon a newly diſcovered vein. This proceſs is called *coſteening*, or *ſhoding*. The width of a lode at the ſurface is no certain indication of its ſize in depth; as, when large at the ſurface, they are ſometimes found to become ſmall as they are purſued downwards; and, on the other hand, veins of moderate width *at graſs* have been found, at 40 or 50 fathoms deep, of great ſize.

The dip or inclination of lodes is ſeldom uniform. The common *underlay* is from one to four feet in a fathom of depth; but inſtances occur of a much greater inclination. The lodes that incline much from the perpendicular are not eſteemed ſo promiſing as thoſe which have a direction more downright; and it is a favourable ſymptom when a lode, from an oblique direction, is found to turn downwards. On the contrary, where bunches of ore *fail*, or become poor, in ſinking on them, it may often be obſerved that the vein *goes away flat*, as miners expreſs it. Thus it will be underſtood, that not only are the dips different in ſeparate lodes, but that the ſame vein frequently varies in this reſpect. Lodes have been obſerved to change their underlay, that is, from dipping to the north, to become perpendicular, and even turn to the ſouth. This is not, however, a matter of frequent occurrence.

The underlay of lodes muſt be aſcertained, when it is intended to ſink perpendicular ſhafts to meet them at certain required depths; and from this is determined the diſtance to be ſet out north or ſouth from the back of the vein, for commencing ſuch ſhafts.

Shafts are often ſunk *upon* the lodes, and of courſe theſe are not perpendicular, but have the ſame inclination as the veins.

Levels driven from the ſhafts, are carried on in the ſubſtance of the lode, follow its direction, and are the principal means by which diſcoveries of ore are made and purſued.

The principal methods by which lodes are diſcovered are the two following: 1. By removing the ſoil covering the ſurface of the rock, by which the back of the vein is laid bare, and expoſed to view. This may happen accidentally, in the formation of roads, ditches, and ſo on; or, as is more uſual, it may be done for the expreſs purpoſe of diſcovery, in conſequence of indications of veins being near at hand, ſuch as detached fragments being found, or ſprings of water impregnated with metal being obſerved. This proceſs is conducted by ſinking trenches, or pits, deep enough to reach the ſurface of the rock, called by miners the *ſhelf;* which trenches are called *ſhoding pits*, or *coſteening pits*. The detached fragments, waſhed from the backs of lodes, are uſually called *ſhodes*, or *ſhode-ſtones*.

The ſecond mode of diſcovering veins is by levels, or horizontal cuts, driven under ground, which in their progreſs through the rock, or, as the miners ſay, acroſs *the country*, interſect and expoſe lodes before unknown. Such levels muſt have a direction acroſs the uſual courſe of the lodes, and are either conducted for the expreſs purpoſe of finding new veins, or for ſome other object; and then may occaſionally be the means of valuable reſults of this ſort.

Many rich mines have been opened, in conſequence of a diſcovery made by carrying on an adit, or by driving a croſs level from a ſhaft, or from one lode to another known to be parallel to it. The practice of driving adits for the purpoſe of diſcovery is more frequent than it uſed to be. The Taviſtock canal has a long tunnel driving through a hill, deſtined principally for this purpoſe, and which has already been attended with very great ſucceſs.

Lodes ſeldom contain ore near the ſurface of the ground: it is, therefore, an eſſential quality in a miner's judgment to decide on the indications preſented by them, and to determine the amount of riſk which their appearances will warrant on a further trial.

There are niceties in this buſineſs which cannot be deſcribed,

ſcribed, but muſt be ſeen and ſtudied to be underſtood, and with which ſkilful miners are converſant; but the moſt experienced is liable to have his predictions falſified by the fluctuating nature of theſe hidden receptacles of various matter.

The indications moſt depended on, in forming a judgment of the value of a lode, are derived from conſidering the following circumſtances:

1. The nature of the ſubſtances contained in the vein.
2. The kind of rock in which it is found.
3. The width and regularity of the vein, conſidering, at the ſame time, its direction and dip.
4. The ſtructure of the vein, ſuch as the being open and pervious to water, or, on the contrary, hard and cloſe.

Theſe ſymptoms may be, on the whole, conſidered as pertaining to veins containing all kinds of metals, though varying in ſome in a certain degree: thus a hard cloſe lode may be favourable for tin, though not ſo for copper or lead.

When a vein is found exhibiting all or moſt of the appearances which experience has determined to belong to thoſe which are productive, it is called a *kindly lode*, and is generally purſued with vigour, and at an expence proportioned to the prevalence and continuance of the favourable ſymptoms.

We ſhall endeavour to conſider the principal indications, according to the order above ſtated, and point out the leading facts to be obſerved in this important branch of a miner's buſineſs.

I. *Of the nature of the ſubſtances contained in the vein.*

Theſe ſubſtances vary according to the depth to which the lode is opened; thoſe near the ſurface being generally different from the contents of the vein deeper under ground.

The firſt thing for which a miner looks is what in Cornwall is called *goſſan*. This ſubſtance does not appear to have been very accurately deſcribed, but is apparently a decompoſed mineral of an iron-ochre colour, varying from yellow to brown-red and chocolate-brown. It is of a ſpongy, cellular texture, of little ſpecific gravity, and is generally ſoft and friable. It is probably the reſult of the decompoſition of pyrites or mundic, together with quartz, and contains a conſiderable portion of iron, and not unfrequently a mixture of tin and copper ores. When theſe latter are preſent in the combination, it is a moſt favourable ſymptom; but even without them, goſſan on the back of a lode warrants a trial to a certain extent. It can by no means be aſſerted, that the moſt promiſing goſſans have always been followed by ore, on a further purſuit; but perhaps there is hardly an inſtance of a lode rich in ore, which has not a bunch of *kindly goſſan* ſomewhere on the back.

The next ſubſtance, proceeding in depth, upon which reliance may be placed, is *mundic*, including in this name pyrites of all kinds, whether arſenical or ſulphuretted, containing iron or copper. Mundic is found at all depths and in all ſituations in veins: it frequently ſurrounds bunches of copper ore, and is therefore a favourable ſymptom, as they are approached; and indicates their decline, when paſſed through on the other ſide. It ſhould, however, be recollected, that mundic is very generally found, and therefore it muſt not be depended on by itſelf.

The earthy ſubſtances, which are eſteemed favourable to the exiſtence of valuable metallic ores, are principally quartz, going under the general name of ſpar; a kind of clay called *flookan*; and, what is not very abundant, *fluor*, diſtinguiſhed by the appellation of *candied ſpar*.

The firſt and the chief ingredient in veins, *quartz*, is kindly, when it is in a looſe friable form, often cryſtallized, and cementing detached fragments of killas and the other ſubſtances before enumerated. It is unpromiſing when in a cloſe amorphous form, and is then termed a *ſharp hungry ſpar*.

The *flookan*, or clay, generally forms a branch or vein on one of the walls of the lode, and ſeems to be the diviſion between that and the rock containing it.

The decompoſition of the adjoining ſtrata ſeems to have been the origin of this ſubſtance, which is called by ſome foreign writers the *ſaalbande*.

Beſides fluor, on which miners are not well agreed as to its promiſing aſpect, and which is not often found in quantity, are ſome other minerals, likewiſe of not very frequent occurrence, but eſteemed favourable; ſuch as *prian*, a kind of decompoſed quartz, and *peach* or chlorite.

Hitherto we have ſaid nothing of the judgment formed by ores found in a lode; it depends upon the following circumſtances:

1. The ſituation, whether ſhallow or deep.
2. The mode of depoſit, whether ſlightly ſprinkled through the lode, or forming ſhoots or bunches of large or ſmall extent.
3. The quality of the ore.

Under the firſt head, moſt miners agree that, as to copper lodes, rich bunches of ore found near the ſurface are not to be depended on as ſhewing that a mine will be very productive; it having often been found that ſuch depoſits have been followed by poverty at a greater depth. Tin and lead are found nearer the ſurface than copper. When a lode is ſpotted with ſmall quantities of ore, and the other ſubſtances are kindly, ſuch as the goſſan and ſpar, the appearance is promiſing; but when the lode is hard, and in other reſpects unkindly, then ſmall ſtrings of ore are not to be reckoned on as particularly favourable. After a certain depth, a regular branch, or, as it is called, a *leader* of ore of any width, occupying part of a good-ſized vein, and increaſing or even fluctuating in ſize as it is purſued, is on the whole the beſt ſymptom, particularly if connected with favourable accompanying ſubſtances.

Under the head of quality of the ore as an indication of future proſperity to a mine, it muſt be remarked that nothing requires to be received with greater caution than promiſes of ſucceſs ſuppoſed to be derived from the richneſs of individual ſpecimens. We are ſpeaking now more particularly of copper lodes. Few, we believe, of the moſt profitable mines produce much ore of the richer varieties, which indeed is ſeldom found to occupy veins of conſiderable width: on the contrary, moſt of the beſt mines are thoſe which yield ore in large quantities, but poorer in metallic content. This obſervation has been likewiſe made on the ſilver mines of South America, according to the account of Humboldt. Copper ores are found in a greater variety of ſpecies near the ſurface than they are in depth; and therefore the miner's experience only will ſerve to diſcriminate perfectly on this point: but we wiſh to put all who are concerned in mining on their guard againſt a fallacious hope, too frequently excited by the aſſay of a ſtone of ore, which in reality often predicts the very reverſe of what it is ſtated to do by the artful or ignorant.

II. The ſecond indication to be attended to, in eſtimating the proſpect of ſucceſs on a particular vein, has been ſtated to be *The kind of rock in which it is found.*

It is unneceſſary here to go into a voluminous account of rocks, becauſe the great mines of England, as well as of the world, being found in ſuch mountains as are conjectured to be of very early formation, do not admit the varieties in this reſpect, which ſome, who are acquainted only with other diſtricts, where probably a later formation has exhibited different phenomena, might conjecture.

Lead-mines, indeed, exiſt in many parts of England, in various rock, and under various circumſtances; but no general rules of mining can be formed from depoſits of a metal, which appears to have taken its place at a period comparatively late. Such rules can only be applicable to ſeparate diſtricts, where the circumſtances attending the depoſits are ſimilar.

There are two general claſſes of rock which claim the diſtinction of metalliferous above all others. Theſe are the *killas* of the Corniſh miner, or grauwacke or tranſition ſlate of Werner; and granitic rocks, including porphyry, gneiſs, and other varieties, known in Cornwall by the general name of *growan*.

Of theſe the great majority of mines are in killas, or grauwacke, not only in Cornwall and Devon, but in Scotland, in the Hartz, in the Saxon Erzgebirge, on the Rhine, in Bohemia, Sileſia, Moravia, Salzburg, and other diſtricts important for their mineral products.

Granitic rocks are not ſo metalliferous as the *killas*, but productive veins are found in them; and, as Dr. Berger has well obſerved in his account of Devon and Cornwall, in the firſt volume of the Tranſactions of the Geological Society, even the killas is not a depôt of metallic veins to any extent, but near its junction with the granite: and this obſervation had been made, as he ſays, by baron Born and Ferber on the mines of the continent.

This fact of moſt mines being in one prevailing rock, would ſeem to ſimplify the exerciſe of judgment in a miner ſpeculating on the effect of the rock upon the contents of a lode. But though killas is ſo univerſal, it is far from being all alike: on the contrary, it conſiſts of many varieties. Theſe varieties do not alternate according to certain rules, like the beds of ſecondary rocks; but exhibit changes in poſition and extent, more or leſs frequent, and moſt uncertain and capricious.

The varieties of killas, which are eſteemed the moſt kindly for copper, are the blue and the white, more eſpecially if of a tender, ſlaty texture. Tin often is found in abundance in harder killas, more irregular in its ſtructure, and of a darker colour, indicating the preſence of iron. Practice alone can enable men to judge of the ſhades of difference in theſe reſpects, which long experience has pointed out as eſſential to be attended to: and even then, allowance muſt be made for exceptions which frequently occur; rules which ſeem to hold good, when applied to one mine, being often inapplicable to another.

III. The third thing to be conſidered is *The width and regularity of the vein, and its direction and dip.*

Theſe are important circumſtances. If the lode be ſmall, it cannot be expected that abundant depoſits of metal can be found; and if it has not the characters belonging to a regular fiſſure, it is probable that the miner will ſoon be diſappointed, by finding it dwindle to a trifling branch, or ſplit into ſeveral inſignificant ramifications.

Every large and productive lode is accompanied by other veins running parallel to it, or nearly ſo, which often fall into the main lode, and generally enrich it by their junction.

Theſe muſt be carefully attended to, and ſought after, as the changes that they produce are often moſt important, and the quantity of ore which they yield is frequently very great. It has indeed been aſſerted, that there is hardly a mine working on a ſingle vein only, which has been profitable to any great degree.

The direction of the lode ſhould be carefully aſcertained; becauſe certain ores are only found in veins which have their courſe in common with others having ſimilar depoſits in the diſtrict.

Thus the writer of the preſent article has obſerved that copper and tin, in Cornwall, muſt only be expected in lodes running eaſt and weſt; while lead is raiſed from ſuch as have a direction at right angles to them, or from north to ſouth.

The more uſual dip or underlay, in copper mines particularly, is to the north; but ſome lodes that underlay to the ſouth have been very productive. In either caſe, it is no favourable ſymptom to find the inclination from the perpendicular to be great; and it may be ſaid to be ſo, if it exceed four feet in the fathom.

When a lode often ſplits or divides into two or more branches, it is ſubject to fluctuation in its produce; and theſe occurrences are important to be noticed with attention, as they afford prognoſtics as to the future ſucceſs of working.

IV. The fourth and laſt head, under which we have arranged the appearances of productive lodes, is that relating to *The ſtructure of the vein, whether open or porous, and thus pervious to water; or, on the other hand, denſe and cloſe, and conſequently dry.*

All miners agree in this, that water being found to be abundant in a lode is an omen of a very favourable nature; and it is often confidently aſſerted, that no large returns of ore have been made from dry veins. As far as the experience of the writer of this article goes, it ſerves to confirm the obſervation.

Water, indeed, may be found paſſing freely through croſs-courſes, and other veins, from which metallic depoſits are abſent; but then ſuch veins will be found to have all the characters which are adduced as proofs of a later formation, and are therefore eaſily diſtinguiſhed from metallic veins.

Large lodes act as natural underdrains, and are channels through which water percolates; ſo that the rock lying on either ſide may often be ſunk upon with but little interruption from water until the vein is cut into, and then abundant ſtreams flow out, and would put an end to further labour, if it were not for the aid of proper engines to get rid of it.

The quantity of water will of courſe be, in ſome degree, proportioned to the extent of the wide and porous parts of the lode; and, as it is from theſe parts only that much ore can be expected, the water forms in the firſt inſtance a pretty good prognoſtic.

If, in driving upon the courſe of a ſmall, cloſe, and unproductive lode, a ſtream of water be ſuddenly met with, it indicates the approach to an enlargement in the vein, and is a moſt favourable ſymptom; and it is, in point of fact, almoſt always obſerved before a good courſe of ore is ſeen.

The mines of Devon and Cornwall abound with water in a much greater degree than perhaps any others; and as evidence of this, we may adduce the number of vaſt ſteam-engines and overſhot water-wheels employed for the ſole purpoſe of draining them. We believe, likewiſe, that when the quantities of ores raiſed in this diſtrict be compared with thoſe of any other which yield them from *true veins*, they will be found abundant in the ſame proportion.

Under the head of the internal ſtructure of lodes may be noticed the cavities, called by the Germans *druſes*, and by the Corniſh miners *voogs*: theſe are obſerved moſt frequently in large veins, and in ſuch, of courſe, aſſiſt in the paſſage of water, and may be claſſed in the ſame place as a favourable indication. In theſe voogs are found all the varieties of cryſtals; and thus the preſence of theſe in a lode is likewiſe conſidered promiſing, more particularly where obſervations are made on a vein at no great depth: for as the mine becomes deeper the lode often becomes more compact, and the miner calculates upon finding *ſolid courſes of ore*.

In connection with this part of the ſubject, the *walls* which encloſe the vein are not to be diſregarded, when the lode itſelf is conſidered, as they ſhould be found to be well determined, ſmooth, and regular. The rock of which they are formed ſhould be of the hard ſchiſt called by miners *capel*; and if penetrated with traces of ore, it may be conſidered as a ſymptom of large depoſits. On each ſide of the walls, which uſually differ ſomewhat from the adjoining rock, as if altered by the preſence of the vein, the ſtrata may generally be obſerved to be twiſted or bent downwards, in a ſlight degree towards the lode, which is in general conſidered to be more the caſe near large veins than near thoſe which are ſmaller.

Having now detailed the principal characteriſtics of lodes, as important to the practical miner, deſcribed the modes of diſcovering them, and the ſymptoms by which a judgment is formed of their contents, as far as relates to working them for the metals; we leave the conſideration of them, in a geological point of view, for the article VEIN. The operations of working upon them will be deſcribed under the head of MINING, and under that of ORE.

LODE, in *Rural Economy*, a provincial term applied to ſignify ford, in ſome diſtricts.

LODER, in *Geography*, a town of Bavaria; 25 miles S. of Augſburg.

LODESAN, a country of Italy, in the Milaneſe, bounded north and weſt by the duchy of Milan, eaſt by the Cremaſco and the Cremones, ſouth by the Piacentin and Paveſe; and now forming the department of the Adda. It is populous and fertile, though ſmall; and particularly celebrated for its cheeſe, of which, it is ſaid, the inhabitants annually export to the amount of 70,000*l.*; the number of cows kept here being reckoned at 30,000. The capital is Lodi.

LODESE', or GAMLA *Lodeſe*, a town of Sweden, in Weſt Gothland, which ſuffered ſo much from fire in the thirteenth and fourteenth centuries, that the inhabitants removed to New Lodeſe, or Nydoleſe.

LODESMAN, or LOCMAN, a pilot eſtabliſhed for conducting veſſels in and out of harbours, or up and down navigable rivers. See PILOT.

LODE'VE, in *Geography*, a town of France, and principal place of a diſtrict, in the department of Hérault, and, before the revolution, the ſee of a biſhop; 24 miles W. of Montpellier. The place contains 7843, and the canton 13,959 inhabitants, on a territory of 307½ kiliometres, in 10 communes. N. lat. 43° 44'. E. long. 3° 24'.

LODGMENT, in *Military Affairs*, ſometimes denotes an encampment made by an army.

LODGMENT is more frequently uſed for a work caſt up by the beſiegers, during their approaches, in ſome dangerous poſt, which they have gained, and where it is abſolutely neceſſary to ſecure themſelves againſt the enemy's fire; as in a covert-way, in a breach, the bottom of a moat, or any other part gained from the beſieged.

Lodgments are made by caſting up earth, or by gabions, or paliſades, woolpacks, faſcines, mantelets, or any thing capable of covering ſoldiers in the place they have gained, and are determined to keep.

LODI, LA, in *Biography*, a young female ſinger, in the ſervice of the elector of Bavaria, at Munich in 1772, and now, if ſhe lives, an old one; ſo that a few remarks upon her ſlight imperfections can do her neither good nor harm, but may probably ſtimulate a wiſh of purification of voice in others. We thought that, in general, the tone of the Lodi's voice was clear and brilliant, and her manner of ſinging and acting elegant and graceful; yet thought, if there was any little defect in her voice, it was occaſioned by a ſlight obſtruction in the throat, particularly in ſuſtaining low notes. Theſe were our thoughts the firſt time we heard her. The ſecond time, we were more pleaſed with her performance than the firſt; yet ſtill imagined that her voice wanted a little more room in its paſſage. The third time we heard her in her beſt character, in the performance of which ſhe ſtill gave us more pleaſure; but yet we could not get rid of our former remarks on the conduct of her voice in ſuſtaining certain low and long notes.

Theſe remarks, made on the Lodi 52 years ago, might, with reſpect to voice, be fairly applied to Mrs. Hindmarſh in 1804.

LODI, in *Geography*, a city of Italy, formerly the chief town of Lodeſan, now the capital of the department of Adda, built by the emperor Frederick Barbaroſſa, on an eminence, in a plain watered by the river Adda. It is the ſee of a biſhop, and contains, beſides the cathedral, two collegiate and ſeven pariſh churches, and 26 convents. This is a place of little trade, its chief commodities being cheeſe (ſee LODESAN) and a beautiful kind of earthen ware reſembling china. It is well built, and ſurrounded with walls, about three miles from the ancient town of the ſame name, called alſo "Laus Pompeii." The number of inhabitants is eſtimated at about 12,000. On the 11th of May 1796, the town was taken by the troops of the French republic, under the command of Bonaparte, Maſſena, and Angereau; after the paſſage of the bridge had been conteſted by 10,000 Auſtrians, and 30 pieces of artillery. The Auſtrians loſt in killed, wounded, and priſoners, between two and three thouſand men; 18 miles S.E. of Milan. N. lat. 45° 21'. E. long. 9° 30'.

LODOMIRIA, a territory of Poland, which, together with *Galicia* (which ſee), was ceded to the houſe of Auſtria in the late partition of Poland, A.D. 1772, and is now incorporated under this appellation with the Auſtrian dominions. The number of inhabitants in this ceded country amounted, in 1776, to 2,580,796. Hoeck computes Eaſtern Galicia and Lodomiria at 2,797,119, and Weſtern Galicia at 1,106,178, The mountainous parts of Galicia and Lodomiria afford fine paſtures; the plains are moſtly ſandy, but abound in foreſts, and are fertile in corn. The principal articles of traffic are cattle, hides, wax, and honey; and theſe countries contain mines of copper, lead, iron, and ſalt.

LODRONE, a town of Italy, in the Trentin, on the borders of the Breſſan, near a ſmall lake, called the "lake of Idro;" 25 miles S.W. of Trent.

LODOSA, a town of Spain, in Navarre, on the Ebro; 17 miles E. of Eſtella.

LODYPOUR, a town of Hindooſtan, in Bahar; 18 miles S. of Patna.

LODZIEZE, a town of Lithuania, in the palatinate of Troki; 48 miles N.N.W. of Grodno.

LOE, a town of Norway; 48 miles N.E. of Drontheim.

LOE, in *Rural Economy*, a term uſed to ſignify a little round hill, or a heap of ſtones.

LOEBEGUN, or LOBOCHIN, a town of the duchy of Magdeburg; 44 miles S. of Magdeburg.

LOEBOE, or LOEHOE, a kingdom of Celebes, which was the moſt powerful and extenſive of all the ſtates of this iſland, before thoſe of Macaſſar and Boni attained their ſubſequent celebrity. It ſtretches at preſent from Palopa, the capital of the country, to Larompo, having an extent of about 20 leagues along the weſtern ſhore of the bay of Boni, and from the other ſide of the city, over the whole of the S.E. part of Celebes, between Bugueſs-bay and the E. coaſt of the iſland, as far as the Alforeſe will ſuffer them inland; to the W. it is bounded by Wadjo, and to the N. by Taradja. The land is fertile in paddee; it yields likewiſe good iron, and much gold is found in the rivers. The firſt king mentioned in the records of the Dutch company, and called "Crain Haroo," was ſubdued by the arms of the company, at the ſame time with the Macaſſars at Bouton. For an account of its diſſolute queen, ſee TANETE.

LOEFLINGIA, in *Botany*, named by Linnæus in honour of his friend and favourite pupil Peter Loefling, a Swede, who was born in the year 1729, in the province of Gäſtrikeland. He began to ſtudy medicine at the age of 16, and from his proficiency in the ſcience of Natural Hiſtory he afterwards obtained, through the recommendation of Linnæus, the appointment of botaniſt to the king of Spain, in which capacity he explored the botanical treaſures of South America, where he died Feb. 22, 1756. His name frequently occurs in the writings of his preceptor, who publiſhed at Stockholm, in 1758, a collection of Loefling's letters, and the Latin deſcriptions of Spaniſh and American plants which he left behind him, with a biographical preface of his own, in Swediſh. A German tranſlation of this volume, by Kölpin, appeared at Berlin in 1766. The inaugural diſſertation of Loefling on "the buds of trees" is printed in the *Amoenitates Academicæ*, v. 2. 182.—Linn. Gen. 24. Schreb. 33. Willd. Sp. Pl. v. 1. 191. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 79. Juſſ. 299. Lamarck Illuſtr. t. 29. Gærtn. t. 129.—Claſs and order, *Triandria Monogynia*. Nat. Ord. *Caryophyllei*, Linn. *Caryophylleæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of five, erect, lanceolate leaves, marked on each ſide at the baſe with a ſmall tooth, ſharp-pointed, permanent. *Cor.* Petals five, very ſmall, oblong-ovate, cloſed together in the form of a globe. *Stam.* Filaments three, the length of the corolla; anthers roundiſh, twin. *Piſt.* Germen ſuperior, ovate, triangular; ſtyle thread-ſhaped, a little dilated upwards; ſtigma rather obtuſe. *Peric.* Capſule ovate, nearly triangular, of one cell and three valves. *Seeds* numerous, ovate-oblong.

Eſſ. Ch. Calyx of five leaves. Corolla of five petals, very ſmall. Capſule of one cell, and three valves.

1. L. *hiſpanicum.* Spaniſh Loeflingia. Linn. Sp. Pl. 50. Loefl. It. 113. t. 1. f. 2. Cavan. Ic. v. 1. 64. t. 94.—Leaves awl-ſhaped, ſharp-pointed. Flowers axillary, ſeſſile.—Found on open hills in the neighbourhood of Madrid, and other parts of Spain, flowering in June.—*Root* annual, zig-zag, ſmooth. *Stems* procumbent, ſometimes a little aſcending, jointed, round, ſlightly pubeſcent, viſcid, about two inches long. *Leaves* in pairs at the joints of the ſtems, ſometimes three or four together. *Flowers* nearly white. Linnæus remarks, that this ſpecies approaches in habit to *Scleranthus* or *Hernieria*.

2. L. *indica.* Indian Loeflingia. Willd. n. 2. Retz. Obſ. faſc. 4. 8. (Pharnaceum depreſſum; Linn. Mant. 562.)—Leaves oblong. Flowers axillary, cymoſe.—A native of rice fields and dried pools in the Eaſt Indies, where it abounds, according to König, in April and May.—*Root* very long and branching. *Stems* numerous, proſtrate, about a ſpan in length, pubeſcent. *Leaves* two, four or more together at the joints, almoſt ſeſſile. *Stipulas* ſolitary, ſmall, membranaceous. *Flowers* nearly ſeſſile, cinereous, with a trifid ſtyle. Linnæus, who places this ſpecies in *Pharnaceum*, ſays that it reſembles a *Mollugo*, and that it puts forth its flowers only in fine weather.—Retzius and Willdenow properly make it a *Loeflingia*, of which authors, the former obſerves, that *L. indica* has dark-green and keeled calyx-leaves with a broad ſcaly margin. The *corolla* is purple, ſmaller than the *calyx*. The *capſule* of one cell, with many ſeeds.

LOEILLET, JOHN, in *Biography*, a relation of John Baptiſt Loeillet of Ghent, the famous maſter on the common flute, and voluminous compoſer for that inſtrument. John the younger was a celebrated harpſichord maſter, and performer in the opera band in London, while Corbet was the leader.

Having a large room in the houſe which he occupied in Hart-ſtreet, Covent Garden, he eſtabliſhed a weekly concert there, which was frequented chiefly by gentlemen performers, who rewarded him liberally for conducting it. Corelli's concertos were firſt performed in England at this concert, where Mr. Needler, at the head of dilettanti players on the violin, was the leader.

Loeillet was not only an excellent teacher of the harpſichord, but a good compoſer for that inſtrument, and a minuet in his leſſons, in the key of A minor, which was in great favour with the ladies of that time, from the vulgar pronunciation of Loeillet's name, was long ſuppoſed to have been compoſed by John Baptiſt Lully, whoſe name was prefixed to it in many printed books, nor was the miſtake ever publicly cleared up.

Loeillet died about the year 1728, after accumulating, by induſtry and economy, a fortune of 16,000*l.* The works which he publiſhed, though numerous, are now only to be traced in Walſh's old catalogues.

LOENEN, in *Geography*, a town of Holland; 10 miles S.W. of Naerden.

LOESDRECHT, a town of Holland; eight miles S. of Naerden.

LOESELIA, in *Botany*, received its name from Linnæus, in honour of John Loeſel, Profeſſor of Medicine at Königſberg in Pruſſia, who was born in the year 1607, and died in 1655. By the direction of our author's will, his ſon edited a catalogue of the native plants of Pruſſia, which is by no means a deſpicable work. It abounds with ſeveral curious notes, and contains many rare plants which till then were unknown as natives of Pruſſia. He had alſo prepared ſeveral excellent plates, and theſe, together with his manuſcripts, partly by the wiſh of his ſon to perpetuate his father's fame, and partly by royal authority, were afterwards committed to the charge of his ſucceſſor, Profeſſor John Gottſched, who compiled from them the *Flora Pruſſica, ſeu Plantæ in Regno Pruſſiæ ſponte naſcentes*, which was publiſhed in quarto in 1703. The book is ſcarce, but is frequently cited for the plates.—Linn. Gen. 317. Royen. L. Bat. 299. Schreb. 415. Willd. Sp. Pl. v. 3. 323. Mart. Mill. Dict. v. 3. Juſſ. 135. Lamarck Illuſtr. t. 527. Gærtn. t. 62. (Royenia; Houſt. MSS.)—Claſs and order, *Didynamia Angioſpermia*. Nat. Ord. *Convolvuli*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, four-cleft, acute, ſhort, permanent. *Cor.* of one petal, unequal; tube the length of the calyx; limb in five, ovate-lanceolate, equal ſegments, all deflexed towards the lower ſide. *Stam.* Filaments four, the length of the corolla, two of them ſhorter, all oppoſite to the ſegments of the petal and reflexed, in a contrary direction to the corolla; anthers ſimple. *Piſt.* Germen ſuperior, ovate; ſtyle ſimple, placed like the ſtamens; ſtigma thickiſh. *Peric.* Capſule ovate, of three cells. *Seeds* ſolitary or two together, ſlightly angulated.

Obſ. Gærtner remarks, that he found five ſtamens in all the flowers of this genus which he had examined, though one of them was conſtantly ſhorter than the reſt. Hence it has been ſuggeſted that *Loeſelia* ſhould be referred to *Pentandria*.

Eſſ. Ch. Calyx four-cleft. Corolla with its ſegments all leaning one way. Stamens oppoſite to the petal. Capſule of three cells.

1. L. *ciliata*. Fringed Loeſelia. Linn. Sp. Pl. 875. Gærtn. t. 62. f. 3.—Found by Dr. Houſtoun at Vera Cruz in South America.—*Stem* erect, ſlightly quadrangular. *Leaves* oppoſite, lanceolate-ovate, ſharply ſerrated. *Flowers* yellow, forming a head at the ends of the branches, accompanied by imbricated, ovate, fringed *bracteas*.

This genus is fully deſcribed by Gærtner, who moſt probably muſt have made his deſcription from the ſpecimen ſent by Dr. Houſtoun to Mr. Miller's collection, now in the poſſeſſion of the right honourable ſir Joſeph Banks. Linnæus had it not in his own herbarium, but appears to have ſeen it in the hands of Adrian Van Royen during his ſtay at Leyden. Hence it found admiſſion into the appendix of the firſt edition of his *Genera Plantarum*, p. 348.

LOEVESTEIN, or Louvestein, in *Geography*, a fortreſs of Holland, where Grotius was confined, and whence he was delivered by a ſtratagem of his wife. See the article Grotius.

LOEVI, in *Ancient Geography*, a people of Italy, whoſe cantonment lay between the rivers Seſſilis and Ticinus, now the Seſia and Teſino.

LOFANGER, in *Geography*, a town of Sweden, in Weſt Bothnia; 40 miles N.N.E. of Umea.

LOFANGO, one of the ſmaller Friendly iſlands; five miles E.S.E. of Neeneeva.

LOFEEREN, a cluſter of ſmall iſlands in the North ſea, near the coaſt of Norway. N. lat. 68°.

LOFFALO, a ſmall iſland in the gulf of Finland. N. lat. 60° 2′. E. long. 46° 3′.

LOFFINGEN, a town of Germany, in the lordſhip of Furſtenberg, having a medicinal bath; ſix miles W. of Furſtenberg.

LOFFODEN Islands, a cluſter of iſlands off the Norwegian coaſt, in N. lat. 67° to 68°. Theſe iſlands are numerous and extenſive, and noted for the whirlpool of Malcſtrom. They have excellent fiſheries, and the paſturage ſuffices for a great number of ſheep.

LOFSTA, a town of Sweden, in Smaland; 70 miles N. of Calmar.—Alſo, a town of Sweden, in the province of Upland, in which are a hammer-mill, eight forges, and a ſmelting furnace; 40 miles N. of Upſal.

LOFTUS Heights, the barrier-port in the S.W. corner of the United States, on the E. ſide of the Miſſiſippi, in Adams county, Miſſiſippi territory, about 40 miles below Natchez. The plan of the works here conſtructed preſents the handſomeſt military object in the United States.

LOFVESTA, a ſea-port town of Sweden, in the province of Schonen; 25 miles S. of Chriſtianſtadt.

LOG, in the *Jewiſh Antiquities*, a meaſure which held a quarter of a cab, and conſequently five-ſixths of a pint. There is mention of a log, 2 Kings, vi. 25. under the name of a *fourth part of a cab*. But in Leviticus the word log is often met with, and ſignifies that meaſure of oil, which lepers were to offer at the temple after they were cured of any diſeaſe.

Dr. Arbuthnot ſays, that the log was a meaſure of liquids, the ſeventy-ſecond part of the bath or ephah, and twelfth part of the hin, according to all the accounts of the Jewiſh writers.

Log, a ſea-term, ſignifying a ſmall piece of timber of a triangular, ſectoral, or quadrantal figure, on board a ſhip, generally about a quarter of an inch thick, and five or ſix inches from the angular point to the circumference. It is balanced by a thin plate of lead, nailed upon the arch, or circular ſide, ſo as to ſwim perpendicularly in the water, with about two-thirds immerſed under the ſurface.

Log-*line*, a little cord, or line, about a hundred and fifty fathoms long, faſtened to the log, by means of two legs, one of which paſſes through a hole at the corner, and is knotted on the oppoſite ſide, while the other leg is attached to the arch by a pin fixed into another hole, ſo as to draw out occaſionally. By theſe legs the log is hung in equilibrio; and the line thus annexed to it is wound round a reel fixed for that purpoſe in the gallery of the ſhip.

This line, from the diſtance of about ten, twelve, or fifteen fathoms off the log, has certain knots or diviſions, which ought to be at leaſt fifty feet from each other; though it was the common practice at ſea, not to have them above forty-two feet aſunder.

The length of each knot ought to be the ſame part of a ſea-mile as half a minute is of an hour; and admitting the meaſurement of Mr. Norwood, who makes a degree on a great circle of the earth to contain 367,200 Engliſh feet, or about 69½ Engliſh ſtatute miles; and, therefore, $\frac{1}{60}$ of it, or a nautical mile, will be 6120 feet; $\frac{1}{120}$th of 6120, or 51 feet, ſhould be the length of each knot. But becauſe it is ſafer to have the reckoning rather before the ſhip than after it, therefore fifty feet may be taken as the proper length of each knot. The knots are ſometimes made to conſiſt only of forty-two feet each, even in the preſent practice; and this method of dividing the log-line was founded on the ſuppoſition that ſixty miles, each of 5000 Engliſh feet, made a degree; for $\frac{1}{120}$th of 5000 is 41⅔, or, in round numbers, 42 feet. Mariners, rather than quit the old way, though known to be erroneous, uſe glaſſes for half minute ones, that run but 24 or 25 ſeconds. They have alſo uſed a line of 45 feet to 30 ſeconds, or a glaſs of 28 ſeconds to 42 feet. When this is the caſe, the diſtance between the knots ſhould be corrected by the following proportion: as 30 is to 50, ſo is the number of ſeconds of the glaſs to the diſtance between the knots upon the line. The heat or moiſture of the weather has often a conſiderable effect upon the glaſs, ſo as to make it run ſlower or faſter; it ſhould, therefore, be frequently tried by the pendulum in the following manner. On a round nail hang a ſtring that has a muſket-ball fixed to one end, carefully meaſuring between the centre of the ball and the ſtring's loop over the peg 39⅛ inches, being the length of a ſecond pendulum; then ſwing it, and count one for every time it paſſes under the peg, beginning at the ſecond time it paſſes, and the number of ſwings made during the time the glaſs is running out, ſhews the ſeconds it contains. The line alſo is liable to relax and ſhrink, and ſhould, therefore, be occaſionally meaſured.

The uſe of the log and line is, to keep account, and make an eſtimate of the ſhip's way, or diſtance run; which is done by obſerving the length of line unwound in half a minute's time, told by a half-minute glaſs; for ſo many knots as run out in that time, ſo many miles the ſhip ſails in an hour. Thus, if there be four knots veered out in half a minute, the ſhip is computed to run four miles an hour.

The author of this device for meaſuring the ſhip's way is not known; and no mention of it occurs till the year 1607, in an Eaſt India voyage, publiſhed by Purchas: but from that time its name occurs in other voyages among his collections: and henceforward it became famous, being taken notice of both by our own authors, and by foreigners; as by Gunter in 1623; Snellius, in 1624; Metius, in 1631; Oughtred, in 1633; Herigone, in 1634; Saltonſtall, in 1636; Norwood, in 1637; Fournier, in 1643; and almoſt by all the ſucceeding writers on navigation of every country. See *Marine* SURVEYOR.

LOG, *to heave the,* as they call it, they throw it into the water, on the lee-ſide, letting it run, till it comes without the eddy of the ſhip's wake; then one, holding a half-minute glaſs, turns it up juſt as the firſt knot, or the mark from which the knots begin to be reckoned, turns off the reel, or paſſes over the ſtern. As ſoon as the glaſs is out, the reel is ſtopped, and the knots run off are told, and their parts eſtimated.

It is uſual to heave the log once every hour in ſhips of war and Eaſt Indiamen; and in all other veſſels, once in two hours; and if at any time of the watch the wind has increaſed or abated at the intervals, ſo as to affect the ſhip's velocity, the officer generally makes a ſuitable allowance for it at the cloſe of the watch.

The log is a very precarious way of computing, and muſt always be corrected by experience and good ſenſe; there being a great deal of uncertainty in the yawing of the ſhip going with the wind aft, or upon the quarter, in the heaving of it, by its coming home, or being drawn after the ſhip, on account of the friction of the reel, and lightneſs of the log, in the courſe of the current, and in the ſtrength of the wind, which ſeldom keeps the ſame tenor for two hours together; which is the interval between the times of uſing the log, in ſhort voyages, though in longer ones they heave it every hour. Yet is this a much more exact way of computing than any other in uſe; much preferable certainly to that of the Spaniards and Portugueſe, who gueſſed at the ſhip's way, by the running of the froth or water by the ſhip's ſide; or to that of the Dutch, who uſed to heave a chip overboard, and to number the paces they walk on the deck, while the chip ſwims between any two marks, or bulk-heads on the ſide.

The above-mentioned errors, and particularly the log's being ſubject to drive with the motion which the water may have at its ſurface, whereas the experiment requires it to be fixed in the place where it is when the mark commencing the knots goes off the reel, have been conſidered by writers, and many methods have been propoſed to remove, or at leaſt to leſſen them. The late M. Bouguer propoſed a method, which has been thought deſerving of particular attention, in the Mem. Acad. Sc. 1747; afterwards in his Treatiſe on Navigation, publiſhed at Paris in 1753, and ſince reprinted in 1760, by the Abbé de la Caille. For this purpoſe, take for the log a conical piece of wood, which fix to the log-line paſſed through or along its axis, at about forty, fifty, or ſixty, or more feet, from one end; and to this end fix the diver, which is a body formed of two equal ſquare pieces of tin, or of thin iron plate, fixed at right angles to one another along their diagonals; and its ſize ſo fitted to that of the cone, that the whole may float. A cone of three inches diameter in the baſe, and of ſix inches in the ſlant height, is propoſed by M. Bouguer to ſuit a diver made of plates about 9$\frac{3}{4}$ inches ſquare; the interſection of the diagonals is joined to the log-line, and the loop and peg fixed as in the common log. However, it has been found, that no kind of wood uſed in Britiſh dock-yards, when formed into a cone of the above dimenſions, will float a diver made of ſtout tin plates, one ſide of the ſquare being 9$\frac{3}{4}$ inches. Such a diver weighing 1$\frac{1}{3}$ lb. avoirdupoiſe, required to float it, a cone of five inches diameter, and twelve inches on the ſlant ſide, ſo as the point of the cone, which was made of light fir, ſhould juſt appear above the water. Now ſuppoſing one ſide of ſuch a ſquare tin diver to be about ten inches, and made of plates only two-thirds of the thickneſs of the former, ſuch a diver would weigh, with its ſolder, about twenty ounces, and can be floated by a light fir cone of four inches diameter in the baſe, and ten inches in the ſlant height or length; and ſuch a compound log might, perhaps, be found on trial to be affected by about as much again as that propoſed by M. Bouguer, and conſequently the difference between the numbers given by the common log and compound log, muſt be augmented by two-thirds of itſelf, for the neceſſary correction, as below. When the compound log of Bouguer, above deſcribed, is hove overboard, the diver will ſink too deep to be much affected by the current or motion of the water at the ſurface; and the log will thereby keep more ſteadily in the place where it firſt fell; and conſequently, the knots run off the reel will ſhew more accurately the ſhip's rate of ſailing. As the common log is affected by the whole motion of the current, ſo this compound log will feel only a part thereof, *viz.* ſuch a part nearly as the reſiſtance of the cone is of the reſiſtance of the diver: then the reſiſtances of the above cone and diver are about as 1 to 5; and conſequently this log will drive but one-fifth part of what the common log would do; and ſo the ſhip's true run will be affected by one-fifth part only of the motion of the waters. To obtain the true rate of ſailing, it will be proper to heave alternately hour and hour, the common log, and this compound log; then the difference of their knots run off, augmented by its one-fourth part, is the correction; which applied to the knots of the common log, will give the ſhip's true rate of ſailing, at the middle time between the hours when theſe logs were hove. The correction is additive, when the compound log's run is the greateſt, otherwiſe it is ſubtractive. To find the courſe made good: increaſe the obſerved angle between the log-lines by one-fourth part; and this gives the correction to be applied to the apparent courſe, or the oppoſite of that ſhewn by the common log; the correction is to be applied to the $\left\{\begin{matrix}\text{right}\\ \text{left}\end{matrix}\right\}$ of the apparent courſe, when the bearing of the common log is to the $\left\{\begin{matrix}\text{left}\\ \text{right}\end{matrix}\right\}$ of the compound log. Or thus: the lengths run off both logs, together with their bearings, being known; in a card or compaſs apply the knots run off, taken from a ſcale of equal parts along their reſpective bearings, from the centre; join the ends, and in this line produced, on the ſide next the compound log's length, take one-fourth of the interval; then a line drawn from the end, thus produced, to the centre of the card, will ſhew the true courſe and diſtance made good. When a current, ſuch as a tide, runs to any depth, the velocity of that current may be much better aſcertained by the compound log than by the common one, provided the diver does not deſcend lower than the run of the current; for as thoſe ſhips which are deepeſt immerged, drive faſteſt with the tide; ſo the diver, by being acted on below, as well as the log on the ſurface, their joint motion will give the total effect to the current's motion better than what could be derived from the motion at the ſurface only. Alſo by ſuch a compound log, the depth to which any current runs, may be eaſily tried. Robertſon's Nav. book ix. § 1.

We have an account in the Voyage to the North Pole, p. 97, of two other logs, which were tried by captain Phipps: one invented by Mr. Ruſſel, the other by Foxon; both conſtructed upon this principle, that a ſpiral, in proceeding its own length in the direction of its axis through a reſiſting medium, makes one revolution round the axis; if, therefore, the revolutions of the ſpiral are regiſtered, the number of times it has gone its own length through the water will be known. In both theſe the motion of the ſpiral in the water is communicated to the clock-work withinboard, by means of a ſmall line, faſtened at one end of the ſpiral, which tows it after the ſhip, and at the other to a ſpindle, which ſets the clock-work in motion. That invented by Mr. Ruſſel has a half ſpiral of two threads, made of copper, and a ſmall dial with clock-work, to regiſter the number of turns of the ſpiral. The other log has a whole ſpiral of wood with one thread, and a larger piece of clock-work, with three dials, two of them to mark the diſtance, and the other divided into knots and fathoms, to ſhew the rate by the half-minute glaſs for the convenience of comparing it with the log. This kind of log will have the advantage of every other in ſmooth water and moderate weather; and it will be uſeful in finding the trim of the ſhip when alone, in ſurveying a coaſt in a ſingle ſhip, or in meaſuring diſtances in a boat between headlands and ſhoals; but it is ſubject to other inconveniences, which will not render it a proper ſubſtitute for the common log. See Phil. Tranſ. vol. xlviii. p. 532.

Log-*board* is a table divided into four or five columns, whereon are marked the reckonings of every day; from whence they are entered into the log-book or traverſe-book, whence it may be tranſcribed into the journals, and how much the ſhip gains in her courſe be eſtimated daily. In the firſt column of the log-board, is entered the hour of the day, from the noon of one day to the noon of the next; in the ſecond and third, the number of knots and fathoms the ſhip is found to run per hour, ſet againſt the hours when the log was hove: in the fourth, the courſes which the ſhip ſteers: and in the fifth, or right-hand column, the winds, the alterations of the ſails, the buſineſs doing aboard, obſervations made of the weather, variations of the compaſs, &c. See Journal.

Log-*book*, at ſea, a book ruled and columned like the log-board. It is uſed by ſome to enter the log-board's account in every day at noon, with the obſervations then made; and from hence it is corrected and entered into the journals. (See Journal.) The intermediate diviſions or watches of the log-book, containing four hours each, are uſually ſigned by the commanding officer in ſhips of war, or Eaſt Indiamen.

LOGAN, in *Geography*, a county of America, in the ſtate of Kentucky, containing 4870 inhabitants, beſides 730 ſlaves.

LOGANIA, in *Botany*, ſo denominated by Mr. R. Brown, after Mr. James Logan, Preſident of the Council, and Chief Juſtice of the Province of Pennſylvania, author of a ſmall Latin tract in ſupport of the Linnæan doctrine of the generation of plants, publiſhed at Leyden, in 1739, and republiſhed, we believe by Dr. Fothergill, at London, in 1747, with an Engliſh tranſlation. Brown Prodr. Nov. Holl. v. 1. 454. (Euoſma; Andr. Repoſ. v. 8. 520.)—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Gentianæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, in five deep equal ſegments, permanent. *Cor.* of one petal, ſomewhat bell-ſhaped, rather hairy in the throat; limb in five deep, equal, roundiſh ſegments. *Stam.* Filaments five, equal, inſerted into ſome part of the tube, ſhorter than the limb; anthers ſmall, roundiſh. *Piſt.* Germen ſuperior, ovate, with a groove at each ſide; ſtyle ſhort, thick, permanent; ſtigma capitate, ſomewhat club-ſhaped. *Peric.* Capſule ovate, with a furrow at each ſide, ſeparating into two parts, each of one cell and two valves, with a longitudinal triangular receptacle to each cell. *Seeds* numerous, roundiſh, peltate, rough.

Eſſ. Ch. Calyx in five deep ſegments. Corolla ſomewhat bell-ſhaped, five-cleft, hairy in the throat. Stamens ſhorter than the limb. Stigma capitate. Capſule ſuperior, with two furrows, four valves, two cells, and a receptacle to each. Seeds peltate.

This New-Holland genus conſiſts of either ſhrubs or herbs, with oppoſite entire leaves, generally attended by ſtipulas, which are either united into a ſmall intrafoliaceous ſheath, or diſtinct; in the latter caſe, within the inſertion of the leaves or at their ſides; ſometimes there are no ſtipulas. Flowers either terminal or axillary, oppoſite in corymbs or cluſters, ſometimes ſolitary. Corolla white, ſometimes veined. Albumen fleſhy. Mr. Brown indicates its near affinity to *Genioſtoma*, ſee that article, and thence to the order of *Apocineæ*, and to *Uſteria*, one of the *Rubiaceæ*. He defines eleven ſpecies, eight of which are ſhrubs, with an obtuſe calyx, and the ſtamens within the tube; the reſt are herbaceous, or but ſlightly ſhrubby, with an acute calyx, and ſomewhat prominent ſtamens. Of the eight firſt-mentioned ſpecies, five have the ſtipulas united into a ſheath or ring within the inſertion of the leaves. Theſe are called true *Loganiæ*. A ſpecimen of them is

L. *latifolia*. Brown n. 2. (Exacum vaginale; Labill. Nov. Holl. v. 1. 37. t. 51.)—Leaves obovate, rather pointed at each end. Flowers corymboſe. Young branches ſmooth. Stem erect.—Native of the ſouthern part of New Holland. The *ſtem* is ſhrubby, about a yard high, with upright, ſquare, ſmooth, leafy branches. *Leaves* oppoſite, ſcarcely ſtalked, coriaceous, broadly obovate, above two inches long, entire, acute, tapering at the baſe, and united by means of the ſhort, tubular, intrafoliaceous *ſtipula*. *Flowers* numerous, in terminal and axillary, ſmooth, repeatedly three-forked, corymboſe *panicles*, with a pair of acute *bracteas* at each ſubdiviſion. It is remarkable that Labillardiere ſays nothing of their colour, neither does he here, or perhaps in any part of his work, ſeem to have made any notes on the ſpot, but merely to have deſcribed the dried ſpecimens after his return.

The three others have either ſetaceous, lateral, diſtinct ſtipulas, or none at all. Theſe anſwer to the genus *Euoſma* of Andrews.

L. *floribunda*. Brown n. 6. (Euoſma albiflora; Andr. Repoſ. t. 520.)—Leaves lanceolate, tapering at each end, ſmooth. Stipulas lateral, briſtle-ſhaped. Cluſters axillary, compound, ſhorter than the leaves; with downy flower-ſtalks.—Sent originally by Dr. White, from Port Jackſon. Mr. Andrews had it in flower from the fine collection of the Marquis of Blandford, at White Knights, where it was trained againſt a ſouth wall in the open air, and in April was covered with a profuſion of white bloſſoms, which had the ſcent of hawthorn. The *ſtem* of this plant was about four feet high, ſhrubby. *Branches* wand-like, oppoſite, ſquare, ſmooth, leafy, reddiſh. *Leaves* willow-like, tapering much at each end, near two inches long; ſmooth, ſhining and dark green above; whitiſh, opaque and obſcurely dotted beneath. *Cluſters* compound, axillary, ſhorter than the leaves. *Flowers* ſomewhat like lily of the valley, but only half as large. *Capſules* rugoſe.

The three laſt ſpecies of this genus, which have, as before mentioned, an acute calyx, and ſtamens inſerted into the throat of the corolla, have received from Mr. Brown a ſort of proviſional generic name, *Stomandra*, expreſſive of this laſt character; ſo that if any perſon chooſes to ſeparate them from *Logania*, he may not be at a loſs what to call them. Theſe are

L. *ſerpyllifolia.* Br. n. 9.—"Somewhat ſhrubby. Leaves ovate. Stipulas within the footſtalks, fringed like the calyx. Flowers terminal, ſomewhat corymboſe."—Gathered by Mr. Brown in the ſouth part of New Holland.

L. *puſilla.* Br. n. 10.—"Herbaceous. Leaves elliptical. Stipulas triangular, within the footſtalks. Flowers axillary, ſolitary."—Native of Port Jackſon.

L. *campanulata.* Br. n. 11.—"Herbaceous. Leaves linear, without ſtipulas. Flowers terminal. Flower-ſtalks and calyx downy."—From the ſouth part of New Holland.

LOGARITHMIC, Atmospherical, is a curve (*Plate* XI. *Analyſis*, *fig*. 2.) deſcribed in the following manner: let the point C repreſent the centre of the earth, C A the earth's ſemidiameter, and A B any height above the ſurface; at A, place a right line A D, of any finite length, at right angles with A C. In the right line A C, towards C, take A β ſuch, that C A may be to A β in the proportion of C B to B A. In a right line drawn through β, at right angles with A C, take β E, of ſuch length, as to be to A D in the proportion of the denſity of the air at B to the denſity at A, the earth's ſurface. The curve, which the point E always touches, is a logarithmic, of which A C is the aſymptote; and is called by Dr. Horſley the atmoſpherical logarithmic.

Imagine this curve deſcribed, and take another height A *b*, and take Aϐ = $\frac{CA \times Ab}{Cb}$, and draw ϐ*e* parallel to β E, meeting the curve in *e*. Then βϐ is the logarithm of the ration of β E to ϐ *e*, or of the denſity at B to the denſity at *b*. But if the greater of the two heights, A B and A *b*, bear but a very ſmall proportion to the ſemidiameter of the earth, their difference B *b* will be very nearly equal to βϐ.

For, becauſe C B : B A = C A : A β by conſtruction.
Therefore, by converſion, C B : C A = C A : C β.
In like manner, and by inverſion, C A : C *b* = C ϐ : C A,
by equi-diſtance perturbate, C B : C *b* = C ϐ : C β,
and converting, C B : B *b* = C ϐ : ϐ β,
by permutation, B *b* : β ϐ = C B : C ϐ.

But when A B is infinitely diminiſhed, C B = C A ultimately. Alſo A *b* being infinitely diminiſhed, C ϐ = C A ultimately. Therefore C B = C ϐ ultimately, and B *b* = β ϐ ultimately. Q. E. D.

Now A B and A *b* will always be ſo ſmall, with reſpect to C A, if B and *b* be ſuppoſed to repreſent any acceſſible places, that C B, C ϐ, and B *b*, β ϐ, may always, in this caſe, be conſidered as in their ultimate proportion of equality.

It is ſtill therefore to be admitted, as a principle, in practice, that the difference of elevation of any two places is as the difference of the tabular logarithms of the heights of the quickſilver in the barometer at the ſame time at both places; that is, it is the logarithm of the ratio of thoſe heights in *ſome* ſyſtem of logarithms. And the heights of the quickſilver being given by obſervation, the difference of elevation will be known, if that particular ſyſtem can be determined; that is, if the *modulus* of the ſyſtem, or the length of the ſubtangent of the curve D E *e* of that ſyſtem, can be aſcertained, in ſome known meaſure, as Engliſh fathoms, or Paris toiſes.

The eaſieſt method of doing this, that theory ſuggeſts, is to compare barometers at two ſtations, ſuppoſe B and *b*, each of a known elevation A B and A *b*, above the level of the ſea. For the logarithms of any given ratio, in different ſyſtems, are proportional to the ſubtangents; and the difference of elevation, B *b*, diminiſhed in the proportion of C B, (the diſtance of the higher ſtation from the earth's centre,) to C ϐ, (a third proportional to C *b*, the diſtance of the lower ſtation from the earth's centre, and C A, the earth's ſemidiameter,) is the logarithm of the ratio of the denſity at B, to the denſity at *b*, (that is, of the columns of quickſilver ſuſtained in the barometer at B and *b*,) in the atmoſpherical ſyſtem. Therefore, as the difference of the tabular logarithms of theſe columns, to the ſubtangent of the tabular ſyſtem, ſo ſhould B *b*, diminiſhed as hath been ſaid, (that is, ſo ſhould βϐ,) be to the ſubtangent of the atmoſpherical logarithmic. The utmoſt height to which we can aſcend, above the level of the ſea, is ſo ſmall, that the reduction of B *b* may, even in this inveſtigation, always be neglected. For, if A B were four Engliſh miles, which exceeds the greateſt acceſſible heights, even of the Peruvian mountains, and A ϐ three, β ϐ would be ſcarce one part in 500 leſs than B *b*. So that, by comparing barometers at different elevations, within a mile above the level of the ſea, the ſubtangent of the atmoſpherical curve might be determined, as it ſhould ſeem, without ſenſible error, by taking ſimply the difference of elevation, without reduction, for the logarithm of the ratio of the obſerved height of the quickſilver in the atmoſpherical ſyſtem.

The ſubtangent is different in length at different times; though M. de Luc has ſhewn, that it is conſtant in a given temperature; ſo that if the temperature of the air is $+ 16\frac{3}{4}$ of his ſcale, the difference of the tabular logarithms of the heights of the quickſilver in the barometer, gives the difference of elevation in 1000dths of a Paris toiſe; whence the number, which is the *modulus* of Briggs's ſyſtem, expreſſes the length of the ſubtangent of the atmoſpherical curve, ſuch as it is in that temperature, in 1000dths of a Paris toiſe, Phil. Tranſ. vol. lxiv. part i. p. 231, &c.

Logarithmic, or Logistic *Curve*, is a curve which obtained its name from its properties and uſes in explaining and conſtructing logarithms; becauſe its ordinates are in geometrical progreſſion, while the correſponding abſciſſas are in arithmetical progreſſion; ſo that the abſciſſas are the logarithms of the correſponding ordinates. Hence the curve may be conſtructed in the following manner. *Fig*. 3. *Plate* XI. *Analyſis.*

Upon any right line as an axis, take the equal parts A B, B C, C D, &c. or the arithmetical progreſſion A B, A C, A D, &c. and at the points A, B, C, D, &c. erect the perpendicular ordinates A P, B Q, C R, D S, &c. in a geometrical progreſſion, and the curve line drawn through the extremities of theſe ordinates P, Q, R, S, &c. is the logarithmic or logiſtic curve, its abſciſſas A B, A C, A D, being as the logarithms of the reſpective correſponding ordinates B Q, C R, D S, &c.

Hence, if any abſciſſa A N = x, its ordinate N O = y, A P = 1, and a = a certain conſtant quantity, or the modulus of the logarithms, then the equation of the curve is $x = a \times \log. y = \log. y^a$; the fluxion of which being taken, it will be $\dot{x} = \frac{a\dot{y}}{y}$; whence the following proportion,

$$\dot{y} : \dot{x} :: y : a;$$

but in any curve $\dot{y} : \dot{x} :: y :$ the ſubtangent A T, and therefore the ſubtangent to this curve, is every where equal to the ſame conſtant quantity a, the modulus of the logarithms.

To find the area contained between any two ordinates.—

Here the fluxion of the area $\dot{A}$, or $y\dot{x}$, is $y \times \frac{a\dot{y}}{y} = a\dot{y}$; which corrected gives $A = a\,(AP - y) = a\,(AP - NO) = a \times PV = AT \times PV$. That is, the area APON, between any two ordinates, is equal to the rectangle of the conſtant ſubtangent, and the difference of the ordinates. And hence, when the abſciſſa is infinite, or the laſt ordinate equal to zero; then the infinitely long area APZ is equal to $AT \times AP$, or double the triangle APT.

To find the content of the ſolid formed by the revolution of the curve about its axis AZ.—The fluxion of the ſolid $\dot{S} = py^2\dot{x} = py^2 \times \frac{a\dot{y}}{y} = pay\dot{y}$, where $p = 3.14159$, &c.; and the correct fluent is $S = \frac{1}{2}pa \times (AP^2 - y^2) = \frac{1}{2}p \times AT \times (AP^2 - NO^2)$, which is half the difference between two cylinders of the common altitude a, or AT, and the radii of their baſes AP, NO. And hence, ſuppoſing the axis infinite towards Z, and conſequently the ordinate at its extremity zero, the content of the infinitely long ſolid will be equal to $\frac{1}{2}pa \times AP^2 = \frac{1}{2}p \times AT \times AP^2$, or half the cylinder on the ſame baſe and its altitude AT.

This curve greatly facilitates the conception of logarithms, and affords a very obvious proof of the very important property of their fluxions, or very ſmall increments; namely, that the fluxion of a number, is to the fluxion of its logarithm as the number is to the ſubtangent. As alſo this property, that if their numbers be taken very nearly equal, ſo that their ratios may differ but a little from a ratio of equality, their difference will be very nearly proportional to the logarithm of the ratio of theſe numbers to each other; which follows from the logarithmic arcs being very little different from their chords when they are taken very ſmall. The conſtant ſubtangent of this curve is, what Cotes calls, the modulus of the ſyſtem of logarithms. This curve has been treated of by a great number of very eminent mathematicians, as Huygens, Le Seur, Keil, Bernouilli, Emerſon, &c. See the latter author's Treatiſe on Curve Lines, page 19.

LOGARITHMIC, *Hyperbolic*. See HYPERBOLIC *Logarithms*.

LOGARITHMIC, or *Logarithmical*, relating to logarithms. Thus we ſay, logarithmic *arithmetic*, *curve*, *line*, *ſcale*, *ſpiral*.

LOGARITHMS, formed from the Greek λογος, *ratio*, and αριθμος, *number*; q. d. *ratio of numbers*; the indices of the ratios of numbers one to another; or a ſeries of artificial numbers proceeding in arithmetical proportion, correſponding to as many others proceeding in geometrical proportion; contrived for the eaſing and expediting of calculation.

LOGARITHMS have been uſually defined *numerorum proportionalium æquidifferentes comites*; but this definition Dr. Halley and Stifelius think deficient, and more accurately define them, *the indices or exponents of the ratios of numbers*; ratio being conſidered as a quantity *ſui generis*, beginning from the ratio of equality, or 1 to 1 = 0, and being affirmative when the ratio is increaſing, and negative when it is decreaſing. But a more ſimple idea of theſe numbers may be formed from the following definition, *viz.* The logarithm of a number is that exponent of ſome other number, which renders the power of the latter equal to the former: thus if $r^x = a$, $r^y = b$, $r^z = c$, &c. then is x the logarithm of a; y the logarithm of b; z the logarithm of c, &c. Alſo r is then called the radix of the ſyſtem, which may be aſſumed at pleaſure; but in the common tables the radix is always 10.

We will conſider theſe numbers under each of the two latter definitions. According to the firſt; if unity be made the common conſequent of all ratios, or the common ſtandard to which all other numbers are to be referred, then every logarithm will be the numeral exponent of the ratio of its natural number to unity. *E. gr.* the ratio of 81 to 1 contains the four following ratios, *viz.* that of 81 to 27, 27 to 9, 9 to 3, and 3 to 1, or $\frac{81}{1} = \frac{81}{27} \times \frac{27}{9} \times \frac{9}{3} \times \frac{3}{1}$; but all theſe ratios are equal to one another, and $\frac{81}{1} = \frac{3}{1} \times \frac{3}{1} \times \frac{3}{1} \times \frac{3}{1} = \overline{\tfrac{3}{1}\big)}^4$; conſequently the logarithm of 81, is four times as great as that of 3. In the ſame manner, the ratio of 24 to 1, or $\frac{24}{1} = \frac{24}{12} \times \frac{12}{4} \times \frac{4}{1} = \frac{2}{1} \times \frac{3}{1} \times \frac{4}{1}$; and, therefore, the logarithm of 24 is equal to the ſum of the logarithms of 2, 3, and 4. And, univerſally, the magnitude of the ratio of A to 1, is to the magnitude of the ratio of B to 1, as the logarithm of A to the logarithm of B. Hence we derive a method of meaſuring all ratios whatever, let their conſequents be what they will: *e. g.* the ratio of A to B, is the exceſs of the ratio of A to 1, above the ratio of B to 1; therefore the numeral exponent of the ratio of A to B, will be the exceſs of the numeral exponent of the ratio of A to 1, above the numeral exponent of the ratio of B to 1, that is, the exceſs of the logarithm of A above the logarithm of B: therefore the magnitude of the ratio of A to B is to the magnitude of the ratio of C to D as the exceſs of the logarithm of A above the logarithm of B, which is the meaſure of the former ratio, is to the exceſs of the logarithm of C above that of D, which is the meaſure of the latter ratio: and thus we ſee that logarithms are as true and proper meaſures of ratios, as circular arcs are of angles.

The nature and genius of logarithms will be eaſily conceived from what follows:—A ſeries of quantities increaſing or decreaſing according to the ſame ratio is called a *geometrical progreſſion*; *e. gr.* 1. 2. 4. 8. 16. 32, &c. A ſeries of quantities increaſing or decreaſing, according to the ſame difference, is called an *arithmetical progreſſion*; *e. gr.* 3. 6. 9. 12. 15. 18. 21. Now, if under the numbers proceeding in a geometrical ratio, be placed as many of thoſe proceeding in the arithmetical one, theſe laſt are called the logarithms of the firſt.

Suppoſe *e. gr.* two progreſſions:

Geomet.	1.	2.	4.	8.	16.	32.	64.	128.	256.	512.
Arithmet.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.

Logarithms.

0 will be the logarithm of the firſt term; *viz.* 1; 5, of the 6th, 32; 7, the logarithm of the 8th, 128, &c.

Theſe indices or logarithms may be adapted to any geometric ſeries; and, therefore, there may be as many kinds of indices or logarithms, as there can be taken kinds of geometric ſeries; but the logarithms moſt convenient for common uſe, are thoſe adapted to a geometrical ſeries increaſing in a ten-fold progreſſion, as in the ſequel. The doctrine and uſe of logarithms may be conceived from the following propoſitions.

1. *If the logarithm of unity be* 0, *the logarithm of the factum or product will be equal to the ſum of the logarithms of the factors.*—For as unity is to one of the factors, ſo is the other factor to the product. So that the logarithm of the product is a fourth equidifferent term to the logarithm of unity, and thoſe of the factors; but the logarithm of unity being 0, the ſum of the logarithms of the factors muſt be the logarithm of the factum, or product. Q. E. D. Hence, ſince the factors of a ſquare are equal to each other, *i. e.* a ſquare is the factum or product of its root multiplied into itſelf, the logarithm of the ſquare will be double the logarithm of the root.

In the ſame manner it appears, that the logarithm of the cube is triple; of the biquadrate, quadruple; of the fifth power, quintuple; of the ſixth, ſextuple, &c. of the logarithm of the root.

Unity, therefore, is to the exponent of the power, as the logarithm of the root to the logarithm of the power.

So that the logarithm of the power is had, if the logarithm of the root be multiplied by its exponent; and the logarithm of the root is had, if the logarithm of the power be divided by its exponent.

And hence we derive one of the great uſes of logarithms, which is to expedite and facilitate the buſineſs of multiplication, involution of powers, and extraction of roots; the former of which is here performed by mere addition, and the two latter by multiplication and diviſion. Thus 3, the ſum of the logarithms 1 and 2, is the logarithm of 8, the product of 2 and 4. In like manner 7, the ſum of the logarithms 2 and 5, is the logarithm of 128, the product of 4 and 32. Again, 6, the logarithm of 64, which is the third power of 4, or 4^3, is equal to 3 × 2. And 8, the logarithm of 256, which is the fourth power of 4, or 4^4, is equal to 4 × 2. Moreover, 3. the logarithm of the ſquare root 8, is half the logarithm 6, of the ſquare 64; and 2, the logarithm of the cube root 4, is one-third the logarithm 6 of the cube 64.

2. *If the logarithm of unity be* 0, *the logarithm of the quotient will be equal to the difference of the logarithms of the diviſor and dividend.*—For as the diviſor is to the dividend, ſo is unity to the quotient; therefore the logarithm of the quotient is a fourth equidifferent number to the logarithms of the diviſor, the dividend, and the logarithm of unity. The logarithm of unity, therefore, being 0, the difference of the logarithm of the diviſor, and that of the dividend, is the logarithm of the quotient. Q. E. D.

Hence appears another great advantage of logarithms; *viz.* their expediting the buſineſs of diviſion, and performing it by a bare ſubtraction. *E. gr.* 2, the difference between 7 and 5, is the logarithm of the quotient 4, obtained by dividing 128 by 32. In like manner, 5, the difference between 8 and 3, is the logarithm of the quotient 32, obtained by dividing 256 by 8.

Theſe properties of logarithms, however, are more obvious according to our latter definition. For in that caſe, if $r^x = a$, and $r^y = b$, x and y being the logarithms of a and b, we have immediately from the firſt principles of algebra,

$$r^x \times r^y = r^{x+y} = ab \qquad \text{Multiplication.}$$

$$r^x \div r^y = r^{x-y} = \frac{a}{b} \qquad \text{Diviſion.}$$

$$(r^x)^n = r^{x \times n} = r^{xn} = a^n \qquad \text{Involution.}$$

$$\sqrt[n]{r^x} = r^{x \div n} = r^{\frac{x}{n}} = \sqrt[n]{a} \qquad \text{Evolution.}$$

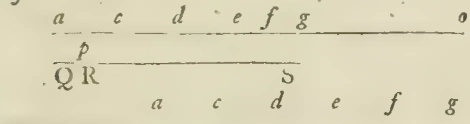
From which formulæ it is evident, that the logarithm of the product of a multiplied by b is equal to the ſum of the logarithms of a and b. The logarithm of the quotient of a divided by b, is equal to the difference of the logarithms of a and b. The logarithm of the nth power of a is equal to n times the logarithm of a. And the logarithm of the nth root of a, is equal to the logarithm of a divided by n. Therefore, univerſally, to multiply two numbers together, we muſt take the ſum of their logarithms: to divide one number by another, we ſubtract the logarithm of the latter from the logarithm of the former. To involve a number to any power, we muſt multiply its logarithm by the index of the power. And to extract the root of any number, we muſt divide its logarithm by the index of the power of which the root is to be found. But each of theſe rules will require a more particular illuſtration, which will be found in the ſubſequent part of this article.

The properties of logarithms hitherto mentioned, and their various uſes, are taken notice of by Stifelius: but they come all far ſhort of the uſe of logarithms in trigonometry, firſt diſcovered by John Napier, baron of Merchiſton, in Scotland, and firſt publiſhed at Edinburgh in 1614, in his Mirifici Logarithmorum Canonis Deſcriptio. This work was tranſlated by Mr Edward Wright, and publiſhed by his ſon, with the aſſiſtance of Mr. Briggs, in the year 1616 or 1618. The method of conſtructing the table was reſerved by the ingenious author, till the ſenſe of the learned upon his invention ſhould be known; nevertheleſs Kepler, in his Chilias Logarithmorum ad totidem Numeros rotundos, publiſhed at Marpurg in 1724; Speidell in his New Logarithms, publiſhed in 1619, and republiſhed with conſiderable additions, in a ſixth impreſſion in 1624; Benj. Urſinius, in his Table of Logarithms, printed at Cologne in 1625, and others, at home and abroad, laboured at the computation of logarithms, and conſtructed ſmall tables, conformable to the plan of lord Napier. But of all thoſe who aſſiſted in the conſtruction of logarithmic tables, Briggs is moſt conſpicuous; it was he who firſt ſuggeſted our preſent ſyſtem, and laboured more than any one in the computation of the numbers it contains. In the preſent ſtate of analyſis many comparatively ſhort and eaſy methods may be employed for this purpoſe, that were unknown to the early writers; and for want of which the labour attending the firſt computation was exceedingly great; ſome idea of which may be formed from the following illuſtration.

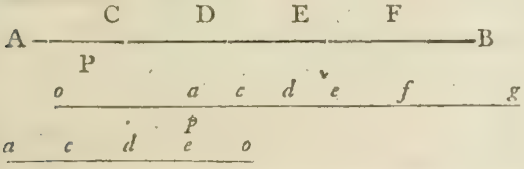
To find the logarithm of any number, according to Briggs's method.—1. Becauſe, 1. 10. 100. 1000. 10000, &c. conſtitute a geometrical progreſſion, their logarithms may be taken at pleaſure: to be able, then, to expreſs the logarithms of the intermediate numbers by decimal fractions, take 0.00000000, 1.00000000, 2.00000000, 3.00000000, 4.00000000. &c. 2. It is manifeſt, that for thoſe numbers which are not contained in the ſcale of geometrical progreſſion, the juſt logarithms cannot be had: yet they may be had ſo near the truth, that, as to matters of uſe, they ſhall be altogether as good as if ſtrictly juſt. To make this appear, ſuppoſe the logarithm of the number 9 were required; between 1.0000000 and 10.0000000, find a mean proportional, and between their logarithms 0.00000000, and 1.00000000 an equidifferent mean, which will be the logarithm thereof; that is, of a number exceeding three by $\frac{1622777}{10000000}$, and therefore far remote from nine. Between 3 and 10, therefore, find another mean proportional, which may come ſomewhat nearer 9; and between 10 and this mean another ſtill; and ſo on between the numbers next greater and next leſs than 9, till at laſt you arrive at 9 $\frac{1}{100000000}$; which not being one millionth part from 9, its logarithm may, without any ſenſible error, be taken for that of 9 itſelf. Seeking then in each caſe for the logarithms of the mean proportionals, you will at laſt have 0.954251, which is exceedingly near the true logarithm of 9. 3. If in like manner you find mean proportionals between 1.0000000 and 3.1622777, and aſſign the proper logarithms to each, you will at length have the logarithm of the number 2, and ſo of the reſt.

Such was the method employed by the early computors of logarithms: and though they had certain means of abridging the operations in particular caſes, yet it is evident that the computation of them was not effected without immenſe labour; a particular and intereſting account of which, with an explanation of the ſeveral modifications of the above method made uſe of by different authors, may be ſeen in the introduction to Dr. Hutton's Mathematical Tables. It is unneceſſary to obſerve, that theſe computations were only required for prime numbers; for theſe being once obtained, the logarithms of all other numbers were found by ſimple addition. At preſent, we have only ſpoken of logarithms as they are applicable to numerical computations. But they are alſo of very extenſive uſe in the higher geometry, particularly in the doctrine of fluxions, and it will not be amiſs, before we quit this part of the ſubject, to give an idea of the way in which they have been conſidered by writers on the latter ſcience. Maclaurin, in his Treatiſe of Fluxions, has explained the nature and geneſis of logarithms, agreeably to the notion of their firſt inventor, lord Napier, delivered in his Mirif. Logar. Canon. Deſcript. He there ſuppoſes logarithms, and the quantities to which they correſpond, to be generated by the motion of a point. If this point moves over equal ſpaces in equal times, the line deſcribed by it increaſes equally.

Again, a line decreaſes proportionally when the point that moves over it deſcribes ſuch parts in equal times as are always in the ſame conſtant ratio to the lines from which they are ſubducted, or to the diſtances of that point at the beginning of thoſe times, from a given term in the line. In like manner, a line may increaſe proportionally, if in equal time the moving point deſcribes ſpaces proportional to its diſtances from a certain term, at the beginning of each time. Thus, in the firſt caſe, let *ac* be to *ao*, *cd* to *co*, *de* to *do*, *ef* to *eo*, *fg* to *fo*, always in the ſame ratio of Q R to Q S; and ſuppoſe that the point *p* ſets out from *a*, deſcribing *ac*, *cd*, *de*, *ef*, *fg*, in equal parts of the time; and let the ſpace deſcribed by *p*, in any given time, be always in the ſame ratio to the diſtance of *p* from *o*, at the beginning of that time, then will the right line *ao* decreaſe proportionally; and the lines *ao*, *co*, *do*, *eo*, *fo*, &c. or the diſtances of the point *p* from *o*, at equal ſucceeding intervals of time, are in a continued geometrical progreſſion.



In like manner, the line *oa* increaſes proportionally, if the point *p* in equal times deſcribes ſpaces *ac*, *cd*, *de*, *ef*, *fg*, &c. ſo that *ac* is to *ao*, *cd* to *co*, *de* to *do*, &c. in a conſtant ratio.



If we now ſuppoſe a point P deſcribing the line A B with an uniform motion, equal to that with which *p* ſets out from *a*, in deſcribing the line *ao*, while the point *p* deſcribes a line increaſing or decreaſing proportionally, the line A P deſcribed by P with this uniform motion, in the ſame time that *oa*, by increaſing or decreaſing proportionally, becomes equal to *op*, is the logarithm of *op*. Thus A C, A D, A E, &c. are the logarithms of *oc*, *od*, *oe*, &c. reſpectively; and *oa* is the quantity whoſe logarithm is ſuppoſed equal to nothing.

We have here abſtracted from numbers, that the doctrine may be the more general; but it is plain, that if A C, A D, A E, &c. be ſuppoſed 1, 2, 3, &c. in arithmetic progreſſion; *oc*, *od*, *oe*, &c. will be in geometric progreſſion; and that the logarithm of *oa*, which may be taken for unity, is nothing.

Lord Napier, in his firſt ſcheme of logarithms, ſuppoſes, that while *op* increaſes or decreaſes proportionally, the uniform motion of the point P, by which the logarithm of *op* is generated, is equal to the velocity of *p* at *a*; that is, at the term of time when the logarithms begin to be generated. Hence logarithms, formed after this model, are called *Napier's* logarithms, and ſometimes *natural* logarithms.

When the ratio is given, the point *p* deſcribes the difference of the terms of the ratio in the ſame time. When a ratio is duplicate of another ratio, the point *p* deſcribes the difference of the terms in a double time. When a ratio is triplicate of another, it deſcribes the difference of the terms in a triple time; and ſo on. Alſo, when a ratio is compounded of two or more ratios, the point *p* deſcribes the difference of the terms of that ratio, in a time equal to the ſum of the times in which it deſcribes the differences of the terms of the ſimple ratios of which it is compounded. And what is here ſaid of the times of the motion of *p*, when *op* increaſes proportionally, is to be applied to the ſpaces deſcribed by P in thoſe times, with its uniform motion.

Hence the chief properties of logarithms are deduced. They are the meaſures of ratios. The exceſs of the logarithm of the antecedent above the logarithm of the conſequent meaſures the ratio of thoſe terms. The meaſure of the ratio of a greater quantity to a leſſer is poſitive, as this ratio compounded with any other ratio increaſes it. The ratio of equality, compounded with any other ratio, neither increaſes nor diminiſhes it; and its meaſure is nothing. The meaſure of the ratio of a leſſer quantity to a greater is negative, as this ratio compounded with any other ratio diminiſhes it. The ratio of any quantity A to unity, compounded with the ratio of unity to A, produces the ratio of A to A, or the ratio of equality; and the meaſures of thoſe two ratios deſtroy each other, when added together: ſo that when the one is conſidered as poſitive, the other is to be conſidered as negative.

When *op* increaſes proportionally, the motion of *p* is perpetually accelerated; and, on the contrary, when *op* decreaſes proportionally, the motion of *p* is perpetually retarded.

If the velocity of the point *p* be always as the diſtance *op*, then will this line increaſe or decreaſe in the manner ſuppoſed by lord Napier: and the velocity of the point *p* being the fluxion of the line *op*, will always vary in the ſame ratio as this quantity itſelf. See Maclaurin's Flux. art. 151—160.

The fluxion of any quantity is to the fluxion of its logarithm, as the quantity itſelf is to unity.

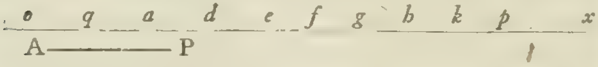
Hence the fluxion of the logarithm of x will be $\frac{\dot{x}}{x}$

For $x : 1 :: \dot{x} : \frac{\dot{x}}{x}$ = the fluxion of the logarithm required.

When *op* increaſes proportionally, the increments generated in any equal times, are accurately in the ſame ratio as the velocities of *p*, or the fluxions of *op*, at the beginning, end, or at any ſimilar terms of thoſe times.

When *op* increaſes, or decreaſes proportionally, the fluxions of this line, in all the higher orders, increaſe or decreaſe in the ſame proportion as the line itſelf increaſes or decreaſes; ſo that one rule ſerves for comparing together, thoſe of any kind at different terms of time; and in this caſe we never arrive at any conſtant or invariable fluxion. If the logarithms of two quantities be always to each other in any invariable ratio, the fluxions of thoſe quantities ſhall be in a ratio that is compounded of a ratio of the quantities themſelves, and of the invariable ratio of their logarithms.

Let *op* be greater than *oa*; *ad* : *ap* : : *oa* : *op*; and let *oa*, *ad*, *de*, *ef*, *fg*, &c. be in continued proportion: then by adding together *ad*, $\frac{1}{2}$ *de*, $\frac{1}{3}$ *ef*, $\frac{1}{4}$ *fg*, &c. we approximate continually to the value of A P, the logarithm of *op*. And we approximate continually to the logarithm of *od*, by ſumming up the differences betwixt *ad* and $\frac{1}{2}$ *de*, $-\frac{1}{3}$ *ef*, and $\frac{1}{4}$ *fg*, $\frac{1}{5}$ *gh* and $\frac{1}{6}$ *hk*, &c. See Maclaurin's Fluxions, art. 171, 172. From what has been ſaid, it follows, that if *ao* : *od* : : *op* : *ox*, then the logarithm of *ox* will be equal to the ſum of the logarithms of *op* and *od*: that is, to the ſum of $ad + \frac{1}{2}de + \frac{1}{3}ef + \frac{1}{4}fg + \frac{1}{5}gh + \frac{1}{6}hk$, &c. and $ad + \frac{1}{2}de + \frac{1}{3}ef - \frac{1}{4}fg - \frac{1}{5}gh + \frac{1}{6}hk$, &c. and $ad - \frac{1}{2}de + \frac{1}{3}ef - \frac{1}{4}fg + \frac{1}{5}gh - \frac{1}{6}hk$, &c. which ſum is $2\,ad + \frac{2}{3}ef + \frac{2}{5}gh$, &c.



Let $aq = ad$; then the logarithm of *ox* will meaſure the ratio of *od* to *oq*. But *od* and *oq* have half their ſum equal to *oa*, and half their difference equal to *ad*, which are the two firſt terms of the geometric progreſſion *oa*, *ad*, *de*, *ef*, *fg*, *gh*, *hk*, &c. Hence, if $oa = 1$, and $ad = x$, *de*, *ef*, *fg*, &c. will be reſpectively, x^2, x^3, x^4, &c. and the ratio of $1 + x$ to $1 - x$ will be equal to that of *od* to *oq*. But the logarithm of this ratio is $2\,ad + \frac{2}{3}ef + \frac{2}{5}gh +$, &c. therefore the logarithm of $\frac{1+x}{1-x} = 2 \times \overline{x + \frac{1}{3}x^3 + \frac{1}{5}x^5 + \frac{1}{7}x^7 + \text{\&c.}}$ agreeably to what has been ſhewn by Dr. Halley and others.

Having thus given an idea of the forms under which logarithms were conſidered, and the methods by which they were computed by ſome of the early writers on this ſubject, it will be proper now to beſtow a few columns, to explain the more modern way of inveſtigating the principles and of computing theſe very uſeful numbers; in doing which, however, the limits of our article will neceſſarily confine our obſervation to only the moſt popular and uſeful formulæ.

We have already defined a logarithm to be the index of a certain number called the radix, which being raiſed to the power denoted by that index or logarithm, will produce the given number. If, therefore, $r^x = N$, then x is the logarithm of N, and r is the radix of the ſyſtem. Now, firſt, in order to find an analytical expreſſion for N in terms of x and r; r^x muſt be converted into a ſeries, for which purpoſe it may be put under the form

$$r^x = (1 + (r-1))^x = 1 + x(r-1) + \frac{x.(x-1)}{1.2}$$

$$(r-1)^2 + \frac{x(x-1)(x-2)}{1.2.3}(r-1)^3 + \text{\&c.}$$

$$= 1 + x\left\{(r-1) - \tfrac{1}{2}(r-1)^2 + \tfrac{1}{3}(r-1)^3 - \text{\&c.}\right\}$$

$$+ \frac{x^2}{1.2}\left\{(r-1)^2 - (r-1)^3 + \text{\&c.}\right\} =$$

$$1 + Ax + A'x^2 + A''x^3 + \text{\&c.}$$

by writing

$$A = (r-1) - \tfrac{1}{2}(r-1)^2 + \tfrac{1}{3}(r-1)^3 - \text{\&c.}$$
$$A' = (r-1)^2 - (r-1)^3 + \text{\&c.}$$
$$A'' = \text{\&c.}$$

where A, A′, A″, A‴, &c. are conſtant but unknown quantities. And now, in order to determine the law by which they are connected with each other, let x be increaſed by any indeterminate quantity z; then $r^{x+z} = 1 + A(x+z) + A'(x+z)^2 + A''(x+z)^3 \ldots\ldots A^{(n-1)}(x+z)^n$; or, expanding the powers of $x + z$, and ſtopping at the firſt two terms, we have

$$\begin{aligned} r^{x+z} = 1 &+ A(x+z) \\ &+ A'(x^2 + 2xz + \text{\&c.}) \\ &+ A''(x^3 + 3x^2z + \text{\&c.}) \\ &+ A^{(n-1)}(x^n + nx^{n-1}z + \text{\&c.}) \\ &+ A^{(n)}(x^{n+1} + (n+1)x^n + \text{\&c.}) \end{aligned}$$

Again

$$r^{x+z} = r^x \times r^z =$$
$$(1 + Ax + A'x^2 + A''x^3 + \text{\&c.}) \times$$
$$(1 + Az + A'z^2 + A''z^3 + \text{\&c.})$$

the actual multiplication of which gives

$$\begin{aligned} r^{x+z} = 1 + A(x+z) + A'x^3 + A''x^3 \ldots A^{(n-1)}x^n \\ A^2xz + A'.Ax^2z \ldots \text{\&c.} \end{aligned}$$

whence, by comparing the correſponding terms in the two expanſions, we have

$$2A' = A^2, \text{ or } A' = \frac{A^2}{2};\quad 3A'' = AA' = \frac{A^3}{2};$$

and therefore $A'' = \frac{A^3}{1.2.3}$

in the ſame way $A''' = \frac{A^4}{1.2.3.4}$

and generally $A^{(n-1)} = \frac{A^n}{1.2.3\ldots n}$

$$A^n = \frac{A^{n+1}}{1.2.3\ldots(n+1)}$$

And conſequently,

$$r^x = N = 1 + Ax + \frac{A^2}{1.2}x^2 + \frac{A^3}{1.2.3}x^3 + \text{\&c.}$$

which is the analytical expreſſion for any number in terms of the radix r and its logarithm x; but the reverſe of this, by which the logarithm is expreſſed in terms of its number and radix, is the formula which is more particularly applicable in the preſent enquiry. This may be found as follows.

In the preceding article we found

$$r = N = 1 + Ax + \frac{A^2}{1.2}x^2 + \frac{A^3}{1.2.3}x^3 + \text{\&c.}$$

where $A = (r-1) - \frac{1}{2}(r-1)^2 + \frac{1}{3}(r-1)^3 - \text{\&c.}$; and if now we make

$$B = (N-1) - \tfrac{1}{2}(N-1)^2 + \tfrac{1}{3}(N-1)^3 - \text{\&c.}$$

we ſhall have on the ſame principles

$$N^z = 1 + Bz + \frac{B^2}{1.2}z^2 + \frac{B^3}{1.2.3}z^3 + \text{\&c.}$$

But

$$N^z = r^{xz} = 1 + Axz + \frac{A^2}{1.2}x^2z^2 + \frac{A^3}{1.2.3}x^3z^3 +$$

&c.; whence, by comparing the co-efficients of z in both ſeries, we have

$$A\,x = B\,;\ \frac{A^2x^2}{1\,.\,2} = \frac{B^2}{1\,.\,2}\,;\ \frac{A^3x^3}{1\,.\,2\,.\,3} = \frac{B^3}{1\,.\,2\,.\,3}\ \&c.;$$

each of which gives the ſame reſult, *viz.* $A\,x = B$; whence we obtain immediately

$$x = \frac{B}{A} = \frac{(N-1) - \frac{1}{2}(N-1)^2 + \frac{1}{3}(N-1)^3 - \ \&c.}{(r-1) - \frac{1}{2}(r-1)^2 + \frac{1}{3}(r-1) - \ \&c.}$$

which is the analytical expreſſion for the logarithm of any number N, in functions of itſelf, and the radix of the ſyſtem; that is, writing a inſtead of N

$$\log.\ a = \frac{(a-1) - \frac{1}{2}(a-1)^2 + \frac{1}{3}(a-1)^3 - \&c.}{(r-1) - \frac{1}{2}(r-1)^2 + \frac{1}{3}(r-1)^3 - \&c.}$$

$$\text{Or, } \log.\ 1 \pm a = \frac{\pm a - \frac{1}{2}a^2 \pm \frac{1}{3}a^3 - \frac{1}{4}a^4 \pm \ \&c.}{(r-1) - \frac{1}{2}(r-1)^2 + \frac{1}{3}(r-1)^3 - \&c.}$$

This, however, muſt only be conſidered as a ſimple algebraical method of expreſſing a logarithm; but it does not always anſwer the purpoſes of calculation, for if a be any number greater than unity, it is obvious that the ſeries in the numerator will either converge very ſlowly, or otherwiſe will diverge, and the ſame with regard to the denominator, ſuppoſing r to be equal to 10, as it is in the common ſyſtem; in fact, the terms of the ſeries are larger the more remote they are from the beginning; and conſequently no number of them can exhibit, either exactly or nearly, the true ſum. Let us, therefore, inveſtigate the method of ſubmitting theſe to calculation; in order to which we will repeat again our laſt ſeries, *viz.*

$$\log.\ 1 \pm a = \frac{\pm a - \frac{1}{2}a^2 \pm \frac{1}{3}a^3 - \frac{1}{4}a^4 \pm \&c.}{(r-1) - \frac{1}{2}(r-1)^2 + \frac{1}{3}(r-1)^3 - \&c.}$$

and here, ſince the denominator is always a conſtant quantity when the radix of the ſyſtem is given, we may make

$$M = (r-1) - \tfrac{1}{2}(r-1)^2 + \tfrac{1}{3}(r-1)^3 - \ \&c.$$

which renders the above expreſſion ſtill more ſimple, as in that caſe it becomes barely

$$\log.\ 1 + a = \frac{1}{M} \times \left\{ a - \tfrac{1}{2}a^2 + \tfrac{1}{3}a^3 - \tfrac{1}{4}a^4 + \&c. \right\}$$

Or, taking a negative,

$$\log.\ 1 - a = \frac{1}{M} \times \left\{ -a - \tfrac{1}{2}a^2 - \tfrac{1}{3}a^3 - \tfrac{1}{4}a^4 - \&c. \right\}$$

Whence again by ſubtraction,

$$\log.\left(\frac{1+a}{1-a}\right) = \frac{2}{M}\left\{ a + \tfrac{1}{3}a^3 + \tfrac{1}{5}a^5 + \tfrac{1}{7}a^7 + \ \&c. \right\}$$

Now $a = \dfrac{1 + \frac{a-1}{a+1}}{1 - \frac{a-1}{a+1}}$; if, therefore, we ſubſtitute in the foregoing expreſſion $\dfrac{a-1}{a+1}$ inſtead of a, it becomes

$$\log.\ a = \frac{2}{M} \times \left\{ \left(\frac{a-1}{a+1}\right) + \tfrac{1}{3}\left(\frac{a-1}{a+1}\right)^3 + \tfrac{1}{5}\left(\frac{a-1}{a+1}\right)^5 + \ \&c. \right\}$$

which ſeries muſt neceſſarily converge; becauſe the denominator of each of the fractions is greater than its numerator; ſtill, however, when a is a number of any conſiderable magnitude, the decreaſe in the terms will be ſo ſlow as to render the formula uſeleſs for the purpoſes of calculation.

At preſent we have aſſumed the ſeries which conſtitutes the denominator in our firſt expreſſion a known quantity, which we have repreſented by M. It will, however, be proper, before we proceed any farther, to offer a few remarks upon the abſolute value of this ſeries, according to any given radix. Firſt then, ſince

$$\log.\ 1 + a = \frac{a - \frac{1}{2}a^2 + \frac{1}{3}a^3 - \frac{1}{4}a^4 + \ \&c.}{(r-1) - \frac{1}{2}(r-1)^2 + \frac{1}{3}(r-1)^3 - \ \&c.}$$

the denominator and numerator of this fraction are totally independent of each other, and therefore r may be aſſumed at pleaſure, and the value of the whole denominator computed for any particular magnitude aſſigned to this letter: or otherwiſe, the whole denominator may be taken equal to any quantity, and the value of r itſelf determined by computation. The latter method, at firſt ſight, appears the moſt eligible; for by aſſuming the whole denominator equal to unity, it diſappears entirely, and the expreſſion becomes

$$\log.\ (1 + a) = a - \tfrac{1}{2}a^2 + \tfrac{1}{3}a^3 - \tfrac{1}{4}a^4 + \ \&c.$$

There are, however, inconveniences attending this ſyſtem, that do not appear upon a ſlight view of the ſubject, but which are notwithſtanding very evident upon a farther inveſtigation. In the caſe in which the whole denominator is aſſumed equal to unity, the value of r, the radix of this particular ſyſtem, is found to be 2.7182818284, &c. and the fraction $\frac{1}{M}$ becomes $= 1$. Theſe conſtitute what are called *hyperbolic logarithms*, and which are treated of under that article in the preſent work. We ſhall, therefore, enter no farther upon the ſubject in this place, than is neceſſary to ſhew the defect of this ſyſtem for general purpoſes, when compared with that now in common uſe, a defect which is by no means compenſated by the trifling advantage attending their computation. In the common ſyſtem the radix r is aſſumed equal to 10, the ſame as the radix of our ſcale of notation; and hence ariſes a moſt important advantage, which is, that the logarithm of all numbers expreſſed by the ſame digits, whether integers, decimals, or mixed of the two, have the ſame decimal part; the only alteration being in the index or characteriſtic of the logarithm. For the radix being 10, 0, 1, 2, 3, &c. will be logarithms of 1, 10, 10^2, &c. that is, $10^0 = 1$, $10^1 = 10$, $10^2 = 100$, &c.; and therefore, to multiply or divide a number by any power of 10, we have only to add or ſubtract the number expreſſing that power from the integral part of the logarithm, and the decimal part will ſtill remain the ſame, by which means the tables of logarithms are much more contracted than they could be with any other radix; for in the hyperbolic ſyſtem, or in any other, which has not its radix the ſame as that of the ſcale of notation, every particular number would require a particular logarithm; and this circumſtance would either ſwell the tables to an unmanageable ſize, or if they were kept within the preſent limits, frequent computations would become neceſſary; ſo that in either way it is clear that the advantages of the preſent logarithms much more than counterbalance the extra trouble in computing them. This in fact only conſiſts in multiplying the hyperbolic logarithm by a conſtant factor; *viz.* the reciprocal of the foregoing conſtant denominator repreſented above by $\frac{1}{M}$, the value of which, when $r = 10$, is $\dfrac{1}{2.30258509, \&c.} = .43429448$, &c. Hence it is obvious, that different ſyſtems of logarithms are connected together by conſtant multipliers, and by means of which a logarithm may always be converted from one ſcale to another. Thus the hyperbolic logarithm of a number is transformed to the common logarithm, by multiplying the former by .4342944; and the latter is converted into the former by multiplying it by 2.30258509.

Having ſaid thus much with regard to advantages of different ſyſtems of logarithms, and the method of transforming them from one ſcale to another; we will now add one example by way of illuſtration. Let it therefore be propoſed to find the common logarithm of 3. In this caſe our

$$\text{ſeries log. } a = \frac{2}{M} \times \left\{ \left(\frac{a-1}{a+1}\right) + \tfrac{1}{3}\left(\frac{a-1}{a+1}\right)^3 + \tfrac{1}{5}\left(\frac{a-1}{a+1}\right)^5 \text{ \&c.} \right\}$$

$$\text{becomes log. } 3 = \frac{2}{M} \times \left\{ \frac{1}{2} + \frac{1}{3 \cdot 2^3} + \frac{1}{5 \cdot 2^5} + \frac{1}{7 \cdot 2^7} + \text{ \&c.} \right\}$$

the computation of which will ſtand thus:

$\frac{1}{2}$ = - - - - - .5

$\frac{1}{3 \cdot 2^3}$ = - - - - - .0416666666

$\frac{1}{5 \cdot 2^5}$ = - - - - - .00625

$\frac{1}{7 \cdot 2^7}$ = - - - - - .0011160714

$\frac{1}{9 \cdot 2^9}$ = - - - - - .0002170138

$\frac{1}{11 \cdot 2^{11}}$ = - - - - - .0000443892

$\frac{1}{13 \cdot 2^{13}}$ = - - - - - .0000093900

$\frac{1}{15 \cdot 2^{15}}$ = - - - - - .0000020345

$\frac{1}{17 \cdot 2^{17}}$ = - - - - - .0000004487

$\frac{1}{19 \cdot 2^{19}}$ = - - - - - .0000001003

$\frac{1}{21 \cdot 2^{21}}$ = - - - - - .0000000227

$\frac{1}{23 \cdot 2^{23}}$ = - - - - - .0000000050

.5493061422

whence $\frac{2}{2.30258509}$, or 43429448 × 5493061422 = .4771212, which is the logarithm of 3 required.

This ſeries, we have already obſerved, will only anſwer for the computation of the logarithms of ſmall numbers, in other caſes different ſeries muſt be employed according to the particular number under conſideration. The limits of this article will not admit of an inveſtigation of the ſeparate caſes. But for the ſake of reference it will be uſeful to ſubjoin a few of the moſt uſeful formulæ, for which purpoſe we avail ourſelves of the ſelection made by Mr. Bonnycaſtle, in his valuable treatiſe of Trigonometry.

$$1.\ \text{Log. } a = \frac{1}{M} \times \left\{ (a-1) - \tfrac{1}{2}(a-1)^2 + \tfrac{1}{3}(a-1)^3 -, \text{ \&c.} \right\}$$

$$2.\ \text{Log. } a = \frac{1}{M} \times \left\{ \left(\frac{a-1}{a}\right) + \tfrac{1}{2}\left(\frac{a-1}{a}\right)^2 + \tfrac{1}{3}\left(\frac{a-1}{a}\right)^3 - \text{ \&c.} \right\}$$

$$3.\ \text{Log. } a = \frac{2}{M} \times \left\{ \left(\frac{a-1}{a+1}\right) + \tfrac{1}{3}\left(\frac{a-1}{a+1}\right)^3 + \tfrac{1}{5}\left(\frac{a-1}{a+1}\right)^{\frac{1}{5}} + \text{ \&c.} \right\}$$

$$4.\ \text{Log. } \frac{a}{b} = \frac{1}{M} \times \left\{ \left(\frac{a \backsim b}{b}\right) - \tfrac{1}{2}\left(\frac{a \backsim b}{b}\right)^2 + \tfrac{1}{3}\left(\frac{a \backsim b}{b}\right)^3 - \text{ \&c.} \right\}$$

$$5.\ \text{Log. } \frac{a}{b} = \frac{1}{M} \times \left\{ \left(\frac{a \backsim b}{a}\right) + \tfrac{1}{2}\left(\frac{a \backsim b}{a}\right)^2 + \tfrac{1}{3}\left(\frac{a \backsim b}{a}\right)^3 - \text{ \&c.} \right\}$$

$$6.\ \text{Log. } \frac{a}{b} = \frac{2}{M} \times \left\{ \left(\frac{a \backsim b}{a+b}\right) + \tfrac{1}{3}\left(\frac{a \backsim b}{a+b}\right)^3 + {}^{\frac{1}{5}}\left(\frac{a \backsim b}{a+b}\right)_{\frac{1}{5}} + \text{ \&c.} \right\}$$

$$7.\ \text{Log. } a = \text{log. } (a-1) + \frac{1}{M} \times \left\{ \frac{1}{a} + \frac{1}{2a^2} + \frac{1}{3a^3} + \frac{1}{4a^4} + \text{ \&c.} \right\}$$

$$8.\ \text{Log. } a = \text{log. } (a-1) + \frac{1}{M} \times \left\{ \frac{1}{a-1} - \frac{1}{2(a-1)^2} + \frac{1}{3(a-1)^3} - \text{ \&c.} \right\}$$

$$9.\ \text{Log. } a = \text{log. } (a-2) + \frac{2}{M} \times \left\{ \frac{1}{a-1} + \frac{1}{3(a-1)^3} + \frac{1}{5(a-1)^5} + \text{ \&c.} \right\}$$

To the above may be added the following, which will be found uſeful on many occaſions.

$$10.\ \text{Log. } a = \frac{1}{M} \times \left\{ (a - a^{-1}) - \tfrac{1}{2}(a^2 - a^{-2}) + \tfrac{1}{3}(a^2 - a^{-3}) - \text{ \&c.} \right\}$$

$$11.\ \text{Log. } (a+z) = \text{log. } a + \frac{1}{M} \times \left\{ \frac{z}{a} - \tfrac{1}{2}\frac{z^2}{a^2} + \tfrac{1}{3}\frac{z^3}{a^3} - \tfrac{1}{4}\frac{z^4}{a^4} + \text{ \&c.} \right\}$$

$$12.\ \text{Log. } (a-z) = \text{log. } a - \frac{1}{M} \times \left\{ \frac{z}{a} + \tfrac{1}{2}\frac{z^2}{a^2} + \tfrac{1}{3}\frac{z^3}{a^3} + \tfrac{1}{4}\frac{z^4}{a^4} + \text{ \&c.} \right\}$$

$$13.\ \text{Log. } (a \pm z) = \text{log. } a \pm \frac{2}{M} \times \left\{ \left(\frac{z}{a+z}\right) + \tfrac{1}{3}\left(\frac{z}{a+z}\right)^3 + \tfrac{1}{5}\left(\frac{z}{a+z}\right)^5 + \text{ \&c.} \right\}$$

$$14.\ \text{Log. } a = \frac{m}{M} \times \left\{ (\sqrt[m]{a} - 1) - \tfrac{1}{2}(\sqrt[m]{a} - 1)^2 + \tfrac{1}{3}(\sqrt[m]{a} - 1)^3 - \text{ \&c.} \right\}$$

Theſe formulæ might have been extended to a much greater length, but thoſe that are given will be found to embrace the generality of caſes, and will be found uſeful on various occaſions.

The publications on the ſubject of logarithms have been ſo numerous, that we can only find room to mention a ſmall portion of them, but as it is uſeful to know which are reputed the beſt, and particularly the beſt editions of the ſame authors, we ſhall ſubjoin the following enumeration, which may be conſidered as containing the moſt reſpectable and accurate works of this kind.

1. The firſt canon of logarithms for natural numbers from 1 to 20,000, and from 90,000 to 100,000, was conſtructed and publiſhed in 1624, by Briggs, with the approbation of the inventor lord Napier.

2. Briggs's logarithms, with their difference to 10 places of figures; as alſo the logarithmic ſines, tangents, &c. by George Miller, London 1631.

3. "Trigonometria," by Richard Norwood 1631, containing a table of logarithms from 1 to 10,000, beſides ſines, tangents, &c.

4. "Directorium Generale Uranometricum," by Francis Bonaventura Cavalerius, Bologna 1632. This work, beſide the uſual table of logarithms, contains ſeveral new and uſeful tables of ſines, verſed ſines, &c. and ſome other original matter.

5. In 1643 appeared the "Trigonometria" of the ſame author, which may alſo be conſidered an intereſting work.

6. "Tabulæ Logarithmicæ" by Nathaniel Rowe, London 1633. In this work the logarithms are given to eight places of figures, for every number from 1 to 100,000, and logarithmic ſines, tangents, &c. to every hundredth part of degrees to ten places.

7. "Trigonometria Britannica" by John Newton, London, 1658. Here the logarithmic tables are put in the moſt convenient form, being nearly the ſame as is now adopted by authors of the preſent period.

8. Adrian Vlacq alſo publiſhed different editions of logarithmic tables, which have been ſince republiſhed; theſe are generally conſidered very accurate and uſeful tables, particularly the edition of 1631.

9. Sherwins's mathematical tables, publiſhed in 8vo. London 1706, form the moſt complete collection of any we have yet noticed; containing, beſides the logarithms of all numbers from 1 to 100,000, the ſines, tangents, ſecants, and verſed ſines, both natural and logarithmic, to every minute of the quadrant. The firſt edition was printed in 1706, but the third, publiſhed in 1742, as reviſed by Gardiner, is conſidered as ſuperior to any other. The fifth, and laſt, edition publiſhed in 1717, is ſo incorrect, that no dependence can be placed upon it.

The third edition above-mentioned, which is called Gardiner's tables, was republiſhed at Avignon, in France, in 1770, but this is not conſidered ſo accurate as the original one by Gardiner himſelf.

10. An "Antilogarithmic Canon," for readily finding the number correſponding to any logarithm, was begun by the algebraiſt Harriot, and completed by Warner, the editor of the former's works, but it was never publiſhed for want of proper encouragement. But a complete canon of this kind was publiſhed by James Dodſon 1742, in which the numbers anſwering to each logarithm from 1 to 100,000, are computed to 11 places of figures.

11. In 1783 was publiſhed, by M. Callet, at Paris, a very neat and uſeful collection of logarithmic tables; and in 1795 an enlarged edition of the ſame work, under the title of "Tables Portative de Logarithms." This is an elegant work, beautifully printed and ſtereotyped, at the celebrated Didot's preſs; it is more correct than the former edition, though it contains a few errors not noticed in the liſt of errata.

12. Dr. Hutton's "Mathematical Tables," containing the common hyperbolic and logiſtic logarithms, alſo ſines, tangents, ſecants, and verſed ſines, both natural and logarithmic, together with ſeveral other tables uſeful in mathematical calculations. To which is prefixed a hiſtory of the diſcoveries and writings of the moſt celebrated authors on this ſubject. This work was firſt publiſhed in 1785, ſince which time it has paſſed through ſeveral editions, which are all very correct.

13. Taylor's tables of logarithmic ſines and tangents to every ſecond of the quadrant, to which is prefixed a table of logarithms from 1 to 100,000. This is a very valuable work, and has a uſeful introduction compoſed by the late aſtronomer royal Dr. Maſkelyne.

14. Vega's tables, publiſhed in Latin and German, is alſo a very excellent performance, particularly the ſecond edition of 1797.

15. Another very accurate and extenſive collection of tables, computed for the decimal diviſion of the circle by Borda, and revived and augmented by Delambre, was publiſhed in Paris. This work is held in great eſteem by the French; but it is of little uſe to Engliſh mathematicians on account of the particular diviſion of the circle. It is, however, preceded by a very perſpicuous and ſcientific inveſtigation of the moſt uſeful logarithmic ſeries, and trigonometrical formulæ; and may therefore be read with intereſt by the general mathematician. Beſides the authors above-mentioned, many others have treated on the ſubject of logarithms, among the principal of whom are Halley, Leibnitz, Mercator, Cotes, Brook Taylor, Euler, Maclaurin, Wolfius, Keill, and Simpſon.

As we have frequent occaſion to refer to tables of logarithms in the courſe of this work; we have ſubjoined a table of logarithms of all numbers from 1 to 10,000, which will be found uſeful in various caſes when other tables may not be at hand.

TABLE of Logarithms, from 1 to 10,000.

N°	0	1	2	3	4	5	6	7	8	9	Diff.
100	0000000	0004341	0008677	0013009	0017337	0021661	0025980	0030295	0034605	0038912	4324
101	0043214	0047512	0051805	0056094	0060380	0064660	0068937	0073210	0077478	0081742	4280
102	0086002	0090257	0094509	0098756	0103000	0107239	0111474	0115704	0119931	0124154	4230
103	0128372	0132587	0136797	0141003	0145205	0149403	0153598	0157788	0161974	0166155	4195
104	0170333	0174507	0178677	0182843	0187005	0191163	0195317	0199467	0203613	0207755	4158
105	0211893	0216027	0220157	0224284	0228406	0232525	0236639	0240750	0244857	0248960	4119
106	0253059	0257154	0261245	0265333	0269415	0273496	0277572	0281644	0285713	0289777	4080
107	0293838	0297895	0301948	0305997	0310043	0314085	0318123	0322157	0326188	0330214	4042
108	0334238	0338257	0342273	0346285	0350293	0354297	0358298	0362295	0366289	0370279	4024
109	0374265	0378248	0382226	0386202	0390173	0394141	0398106	0402066	0406023	0409977	3968
110	0413927	0417873	0421816	0425755	0429691	0433623	0437551	0441476	0445398	0449315	3932
111	0453230	0457141	0461048	0464952	0468852	0472749	0476642	0480532	0484418	0488301	3897
112	0492180	0496056	0499929	0503798	0507663	0511525	0515384	0519239	0523091	0526939	3862
113	0530784	0534626	0538464	0542299	0546131	0549959	0553783	0557605	0561423	0565237	3828
114	0569049	0572856	0576661	0580462	0584260	0588055	0591846	0595634	0599419	0603200	3795
115	0606978	0610753	0614525	0618293	0622058	0625820	0629578	0633334	0637086	0640834	3762
116	0644580	0648322	0652061	0655797	0659530	0663259	0666986	0670709	0674428	0678145	3729
117	0681859	0685569	0689276	0692980	0696681	0700379	0704073	0707765	0711453	0715138	3693
118	0718820	0722499	0726175	0729847	0733517	0737184	0740847	0744507	0748164	0751819	3667
119	0755470	0759118	0762763	0766404	0770043	0773679	0777312	0780942	0784568	0788192	3636
120	0791812	0795430	0799045	0802656	0806265	0809870	0813473	0817073	0820669	0824263	3605
121	0827854	0831441	0835026	0838608	0842187	0845763	0849336	0852906	0856473	0860037	3576
122	0863598	0867157	0870712	0874265	0877814	0881361	0884905	0888446	0891984	0895519	3547
123	0899051	0902581	0906107	0909631	0913152	0916670	0920185	0923697	0927206	0930713	3518
124	0934217	0937718	0941216	0944711	0948204	0951694	0955180	0958665	0962146	0965624	3490
125	0969100	0972573	0976043	0979511	0982975	0986437	0989896	0993353	0996806	1000257	3462
126	1003705	1007151	1010594	1014034	1017471	1020905	1024337	1027766	1031193	1034616	3434
127	1038037	1041456	1044871	1048284	1051694	1055102	1058507	1061909	1065309	1068705	3408
128	1072100	1075491	1078880	1082267	1085650	1089031	1092410	1095785	1099159	1102529	3381
129	1105897	1109262	1112625	1115985	1119343	1122698	1126050	1129400	1132747	1136092	3355
130	1139434	1142773	1146110	1149444	1152776	1156105	1159432	1162756	1166077	1169396	3329
131	1172713	1176027	1179338	1182647	1185954	1189258	1192559	1195858	1199154	1202448	3304
132	1205739	1209028	1212315	1215598	1218880	1222159	1225435	1228709	1231981	1235250	3279
133	1238516	1241781	1245042	1248301	1251558	1254813	1258065	1261314	1264561	1267806	3255
134	1271048	1274288	1277525	1280760	1283993	1287223	1290451	1293676	1296899	1300119	3230
135	1303338	1306553	1309767	1312978	1316187	1319393	1322597	1325798	1328998	1332195	3206
136	1335389	1338581	1341771	1344959	1348144	1351327	1354507	1357685	1360861	1364034	3183
137	1367206	1370375	1373541	1376705	1379867	1383027	1386184	1389339	1392492	1395643	3160
138	1398791	1401937	1405080	1408222	1411361	1414498	1417632	1420765	1423895	1427022	3137
139	1430148	1433271	1436392	1439511	1442628	1445742	1448854	1451964	1455072	1458177	3114
140	1461280	1464381	1467480	1470577	1473671	1476763	1479853	1482941	1486027	1489110	3092
141	1492191	1495270	1498347	1501422	1504494	1507564	1510633	1513699	1516762	1519824	3070
142	1522883	1525941	1528996	1532049	1535100	1538149	1541195	1544240	1547282	1550322	3040
143	1553360	1556396	1559430	1562462	1565492	1568519	1571544	1574568	1577589	1580608	3027
144	1583625	1586640	1589653	1592663	1595672	1598678	1601683	1604685	1607686	1610684	3006
145	1613680	1616674	1619666	1622656	1625644	1628630	1631614	1634596	1637575	1640553	2986
146	1643529	1646502	1649474	1652443	1655411	1658376	1661340	1664301	1667261	1670218	2965
147	1673173	1676127	1679078	1682027	1684975	1687920	1690864	1693805	1696744	1699682	2945
148	1702617	1705551	1708482	1711412	1714340	1717265	1720188	1723110	1726029	1728947	2926
149	1731863	1734776	1737688	1740598	1743506	1746412	1749316	1752218	1755118	1758016	2906

Table of Logarithms.

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151	1789769	1792645	1795518	1798389	1801259	1804126	1806992	1809856	1812718	1815578	2867
152	1818436	1821292	1824147	1826999	1829850	1832698	1835545	1838390	1841234	1844075	2848
153	1846914	1849752	1852588	1855422	1858254	1861084	1863912	1866739	1869563	1872386	2830
154	1875207	1878026	1880844	1883659	1886473	1889285	1892095	1894903	1897710	1900514	2811
155	1903317	1906118	1908917	1911715	1914510	1917304	1920096	1922886	1925675	1928461	2794
156	1931246	1934029	1936810	1939590	1942367	1945143	1947918	1950690	1953461	1956229	2776
157	1958997	1961762	1964525	1967287	1970047	1972806	1975562	1978317	1981070	1983821	2759
158	1986571	1989319	1992065	1994809	1997552	2000293	2003032	2005769	2008505	2011239	2741
159	2013971	2016702	2019431	2022158	2024883	2027607	2030329	2033049	2035768	2038485	2724
160	2041200	2043913	2046625	2049335	2052044	2054750	2057455	2060159	2062860	2065560	2706
161	2068259	2070955	2073650	2076344	2079035	2081725	2084414	2087100	2089785	2092468	2690
162	2095150	2097830	2100508	2103185	2105860	2108534	2111205	2113876	2116544	2119211	2674
163	2121876	2124540	2127202	2129862	2132521	2135178	2137833	2140487	2143139	2145789	2657
164	2148438	2151086	2153732	2156376	2159018	2161659	2164298	2166936	2169572	2172207	2641
165	2174839	2177471	2180100	2182729	2185355	2187980	2190603	2193225	2195845	2198464	2625
166	2201081	2203696	2206310	2208922	2211533	2214142	2216750	2219356	2221960	2224563	2609
167	2227165	2229764	2232363	2234959	2237555	2240148	2242740	2245331	2247920	2250507	2593
168	2253093	2255677	2258260	2260841	2263421	2265999	2268576	2271151	2273724	2276296	2578
169	2278867	2281436	2284004	2286570	2289134	2291697	2294258	2296818	2299377	2301934	2563
170	2304489	2307043	2309596	2312146	2314696	2317244	2319790	2322335	2324879	2327421	2548
171	2329961	2332500	2335038	2337574	2340108	2342641	2345173	2347703	2350232	2352759	2533
172	2355284	2357809	2360331	2362853	2365373	2367891	2370408	2372923	2375437	2377950	2518
173	2380461	2382971	2385479	2387986	2390491	2392995	2395497	2397998	2400498	2402996	2504
174	2405492	2407988	2410482	2412974	2415465	2417954	2420442	2422929	2425414	2427898	2489
175	2430380	2432861	2435341	2437819	2440296	2442771	2445245	2447718	2450189	2452658	2475
176	2455127	2457594	2460059	2462523	2464986	2467447	2469907	2472365	2474823	2477278	2461
177	2479733	2482186	2484637	2487087	2489536	2491984	2494430	2496874	2499318	2501759	2448
178	2504200	2506639	2509077	2511513	2513949	2516382	2518815	2521246	2523675	2526103	2433
179	2528530	2530956	2533380	2535803	2538224	2540645	2543063	2545481	2547897	2550312	2421
180	2552725	2555137	2557548	2559957	2562365	2564772	2567177	2569582	2571984	2574386	2407
181	2576786	2579185	2581582	2583978	2586373	2588766	2591158	2593549	2595939	2598327	2393
182	2600714	2603099	2605484	2607867	2610248	2612629	2615008	2617385	2619762	2622137	2381
183	2624511	2626883	2629255	2631625	2633993	2636361	2638727	2641092	2643455	2645817	2368
184	2648178	2650538	2652896	2655253	2657609	2659964	2662317	2664669	2667020	2669369	2355
185	2671717	2674064	2676410	2678754	2681097	2683439	2685780	2688119	2690457	2692794	2342
186	2695129	2697464	2699797	2702129	2704459	2706788	2709116	2711443	2713769	2716093	2329
187	2718416	2720738	2723058	2725378	2727696	2730013	2732328	2734643	2736956	2739268	2317
188	2741578	2743888	2746196	2748503	2750809	2753114	2755417	2757719	2760020	2762320	2305
189	2764618	2766915	2769211	2771506	2773800	2776092	2778383	2780673	2782962	2785250	2292
190	2787536	2789821	2792105	2794388	2796669	2798950	2801229	2803507	2805784	2808059	2281
191	2810334	2812607	2814879	2817150	2819419	2821688	2823955	2826221	2828486	2830750	2269
192	2833012	2835274	2837534	2839793	2842051	2844307	2846563	2848817	2851070	2853322	2256
193	2855573	2857823	2860071	2862319	2864565	2866810	2869054	2871296	2873538	2875778	2245
194	2878017	2880255	2882492	2884728	2886963	2889196	2891428	2893660	2895890	2898118	2233
195	2900346	2902573	2904798	2907022	2909246	2911468	2913689	2915908	2018127	2920344	2222
196	2922561	2924776	2926990	2929203	2931415	2933626	2935835	2938044	2940251	2942457	2211
197	2944662	2946866	2949069	2951271	2953471	2955671	2957869	2960067	2962263	2964458	2200
198	2966652	2968845	2971037	2973227	2975417	2977605	2979792	2981979	2984164	2986348	2188
199	2988531	2990713	2992893	2995073	2997252	2999429	3001605	3003781	3005955	3008128	2177

TABLE of Logarithms.

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200	3010300	3012471	3014641	3016809	3018977	3021144	3023309	3025474	3027637	3029799	2167
201	3031961	3034121	3036280	3038438	3040595	3042751	3044905	3047059	3049212	3051363	2156
202	3053514	3055663	3057812	3059959	3062105	3064250	3066394	3068537	3070680	3072820	2145
203	3074960	3077099	3079237	3081374	3083509	3085644	3087778	3089910	3092042	3094172	2135
204	3096302	3098430	3100557	3102684	3104809	3106933	3109056	3111178	3113300	3115420	2124
205	3117539	3119657	3121774	3123889	3126004	3128118	3130231	3132343	3134454	3136563	2114
206	3138672	3140780	3142887	3144992	3147097	3149201	3151303	3153405	3155505	3157605	2104
207	3159703	3161801	3163898	3165993	3168088	3170181	3172273	3174365	3176455	3178545	2093
208	3180633	3182721	3184807	3186893	3188977	3191061	3193143	3195224	3197305	3199384	2084
209	3201463	3203540	3205617	3207692	3209767	3211840	3213913	3215984	3218055	3220124	2073
210	3222193	3424261	3226327	3228393	3230457	3232521	3234584	3236645	3238706	3240766	2064
211	3242825	3244882	3246939	3248995	3251050	3253104	3255157	3257209	3259260	3261310	2054
212	3263359	3265407	3267454	3269500	3271545	3273589	3275633	3277675	3279716	3281757	2044
213	3283796	3285834	3287872	3289909	3291944	3293979	3296012	3298045	3300077	3302108	2032
214	3304138	3306167	3308195	3310222	3312248	3314273	3316297	3318320	3320343	3322364	2025
215	3324385	3326404	3328423	3330440	3332457	3334473	3336488	3338501	3340514	3342526	2016
216	3344538	3346548	3348557	3350565	3352573	3354579	3356585	3358589	3360593	3362596	2006
217	3364597	3366598	3368598	3370597	3372595	3374593	3376589	3378584	3380579	3382572	1998
218	3384565	3386557	3388547	3390537	3392526	3394514	3396502	3398488	3400473	3402458	1988
219	3404441	3406424	3408405	3410386	3412366	3414345	3416323	3418301	3420277	3422252	1979
220	3424227	3426200	3428173	3430145	3432116	3434086	3436055	3438023	3439991	3441957	1970
221	3443923	3445887	3447851	3449814	3451776	3453737	3455698	3457657	3459615	3461573	1961
222	3463530	3465486	3467441	3469395	3471348	3473300	3475252	3477202	3479152	3481101	1952
223	3483049	3484996	3486942	3488887	3490832	3492775	3494718	3496660	3498601	3500541	1943
224	3502480	3504419	3506356	3508293	3510229	3512163	3514098	3516031	3417963	3519895	1934
225	3521825	3523755	3525684	3527612	3529539	3531465	3533391	3535316	3537239	3539162	1926
226	3541084	3543006	3544926	3546846	3548764	3550682	3552599	3554515	3556431	3558345	1918
227	3560259	3562171	3564083	3565994	3567905	3569814	3571723	3573630	3575537	3577443	1909
228	3579348	3581253	3583156	3585059	3586961	3588862	3590762	3592662	3594560	3596458	1901
229	3598355	3600251	3602146	3604041	3605934	3607827	3609719	3611010	3613500	3615390	1893
230	3617278	3619166	3621053	3622939	3624825	3626709	3628593	3630476	3632358	3634239	1884
231	3636120	3637999	3639878	3641756	3643634	3645510	3647386	3649260	3651134	3653007	1876
232	3654880	3656751	3658622	3660492	3662361	3664230	3666097	3667964	3669830	3671695	1869
233	3673559	3675423	3677285	3679147	3681009	3682869	3684728	3686587	3688445	3690302	1860
234	3692159	3694014	3695869	3697723	3699576	3701428	3703280	3705131	3706981	3708830	1852
235	3710679	3712526	3714373	3716219	3718065	3719909	3721753	3723596	3725438	3727279	1844
236	3729120	3730960	3732799	3734637	3736475	3738311	3740147	3741983	3743817	3745651	1836
237	3747483	3749316	3751147	3752977	3754807	3756636	3758464	3760292	3762119	3763944	1829
238	3765770	3767594	3769418	3771240	3773063	3774884	3776704	3778524	3780343	3782161	1821
239	3783979	3785796	3787612	3789427	3791241	3793055	3794868	3796680	3798492	3800302	1814
240	3802112	3803922	3805730	3807538	3809345	3811151	3812956	3814761	3816565	3818368	1806
241	3820170	3821972	3823773	3825573	3827373	3829171	3830969	3832767	3834563	3836359	1798
242	3838154	3839948	3841741	3843534	3845326	3847117	3848908	3850698	3852487	3854275	1791
243	3856063	3857850	3859636	3861421	3863206	3864990	3866773	3868555	3870337	3872118	1784
244	3873898	3875678	3877457	3879235	3881012	3882789	3884565	3886340	3888114	3889888	1777
245	3891661	3893433	3895205	3896975	3898746	3900515	3902284	3904052	3905819	3907585	1768
246	3909351	3911116	3912880	3914644	3916407	3918169	3919931	3921691	3923452	3925211	1762
247	3926970	3928727	3930485	3932241	3933997	3935752	3937506	3939260	3941013	3942765	1755
248	3944517	3946268	3948018	3949767	3951516	3953264	3955011	3956758	3958504	3960249	1748
249	3961993	3963737	3965480	3967223	3968964	3970705	3972446	3974185	3975924	3977663	1739

Table of Logarithms.

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250	3979400	3981137	3982873	3984608	3986343	3988077	3989811	3991543	3993275	3995007	1734
251	3996737	3998467	4000196	4001925	4003653	4005380	4007106	4008832	4010557	4012282	1727
252	4014005	4015728	4017451	4019173	4020894	4022614	4024333	4026052	4027771	4029488	1720
253	4031205	4032921	4034637	4036352	4038066	4039780	4041492	4043205	4044916	4046627	1714
254	4048337	4050047	4051755	4053464	4055171	4056878	4058584	4060289	4061994	4063698	1707
255	4065402	4067105	4068807	4070508	4072209	4073909	4075608	4077307	4079005	4080703	1700
256	4082400	4084096	4085791	4087486	4089180	4090874	4092567	4094259	4095950	4097641	1694
257	4099331	4101021	4102710	4104398	4106085	4107772	4109459	4111144	4112829	4114513	1687
258	4116197	4117880	4119562	4121244	4122925	4124605	4126285	4127964	4129643	4131321	1680
259	4132998	4134674	4136350	4138025	4139700	4141374	4142047	4144719	4146391	4148063	1674
260	4149733	4151404	4153073	4154742	4156410	4158077	4159744	4161410	4163076	4164741	1667
261	4166405	4168069	4169732	4171394	4173056	4174717	4176377	4178037	4179696	4181355	1661
262	4183013	4184670	4186327	4187983	4189638	4191293	4192947	4194601	4196254	4197906	1655
263	4199557	4201208	4202859	4204509	4206158	4207806	4209454	4211101	4212748	4214394	1648
264	4216039	4217684	4219328	4220972	4222615	4224257	4225898	4227539	4229180	4230820	1642
265	4232459	4234097	4235735	4237372	4239009	4240645	4242281	4243916	4245550	4247183	1636
266	4248816	4250449	4252081	4253712	4255342	4256972	4258601	4260230	4261858	4263486	1630
267	4265113	4266739	4268365	4269990	4271614	4273238	4274861	4276484	4278106	4279727	1624
268	4281348	4282968	4284588	4286207	4287825	4288443	4291060	4292677	4294293	4295908	1618
269	4297523	4299137	4300751	4302364	4303976	4305588	4307199	4308809	4310419	4312029	1612
270	4313638	4315246	4316853	4318460	4320067	4321673	4323278	4324883	4326487	4328090	1606
271	4329693	4331295	4332897	4334498	4336098	4337698	4339298	4340896	4342495	4344092	1600
272	4345689	4347285	4348881	4350476	4352071	4353665	4355259	4356851	4358444	4360035	1594
273	4361626	4363217	4364807	4366396	4367985	4369573	4371161	4372748	4374334	4375920	1588
274	4377506	4379090	4380675	4382258	4383841	4385423	4387005	4388587	4390167	4391747	1582
275	4393327	4394906	4396484	4398062	4399639	4401216	4402792	4404368	4405943	4407517	1577
276	4409091	4410664	4412237	4413809	4415380	4416951	4418522	4420092	4421661	4423230	1571
277	4424798	4426365	4427932	4429499	4431065	4432630	4434195	4435759	4437322	4438885	1565
278	4440448	4442010	4443571	4445132	4446692	4448252	4449811	4451370	4452928	4454485	1560
279	4456042	4457598	4459154	4460709	4462264	4463818	4465372	4466925	4468477	4470029	1554
280	4471580	4473131	4474681	4476231	4477780	4479329	4480877	4482424	4483971	4485517	1549
281	4487063	4488608	4490153	4491697	4493241	4494784	4496327	4497868	4499410	4500951	1543
282	4502491	4504031	4505570	4507109	4508647	4510185	4511722	4513258	4514794	4516329	1538
283	4517864	4519399	4520932	4522466	4523998	4525531	4527062	4528593	4530124	4531654	1533
284	4533183	4534712	4536241	4537769	4539296	4540823	4542349	4543875	4545400	4546924	1527
285	4548449	4549972	4551495	4553018	4554540	4556061	4557582	4559102	4560622	4562142	1521
286	4563660	4565179	4566696	4568213	4569730	4571246	4572762	4574277	4575791	4577305	1516
287	4578819	4580332	4581844	4583356	4584868	4586378	4587889	4589399	4590908	4692417	1510
288	4593925	4595433	4596940	4598446	4599953	4601458	4602963	4604468	4605972	4607475	1505
289	4608978	4610481	4611983	4613484	4614985	4616486	4617986	4619485	4620984	4622482	1501
290	4623980	4625477	4626974	4628470	4629966	4631461	4632956	4634450	4635944	4637437	1495
291	4638930	4640422	4641914	4643405	4644895	4646386	4647875	4649364	4650853	4652341	1491
292	4653829	4655316	4656802	4658288	4659774	4661259	4662743	4664227	4665711	4667194	1485
293	4668676	4670158	4671640	4673121	4674601	4676081	4677561	4679039	4680518	4681996	1480
294	4683473	4684950	4686427	4687903	4689378	4690853	4692327	4693801	4695275	4696748	1475
295	4698220	4699692	4701164	4702634	4704105	4705575	4707044	4708513	4709982	4711450	1470
296	4712917	4714384	4715851	4717317	4718782	4720247	4721711	4723175	4724639	4726102	1465
297	4727564	4729027	4730488	4731949	4733410	4734870	4736329	4737788	4739247	4740705	1460
298	4742163	4743620	4745076	4746533	4747988	4749443	4750898	4752352	4753806	4755259	1455
299	4756712	4758164	4759616	4761067	4762518	4763968	4765418	4766867	4768316	4769765	1450

Table of Logarithms.

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300	4771213	4772660	4774107	4775553	4776999	4778445	4779890	4781334	4782778	4784222	1446
301	4785665	4787108	4788550	4789991	4791432	4792873	4794313	4795753	4797192	4798631	1441
302	4800069	4801507	4802945	4804381	4805818	4807254	4808689	4810124	4811559	4812993	1436
303	4814426	4815859	4817292	4818724	4820156	4821587	4823018	4824448	4825878	4827307	1431
304	4828736	4830164	4831592	4833020	4834446	4835873	4837299	4838725	4840150	4841574	1427
305	4842998	4844422	4845845	4847268	4848690	4850112	4851533	4852954	4854375	4855795	1422
306	4857214	4858633	4860052	4861470	4862888	4864305	4865722	4867138	4868554	4869969	1417
307	4871384	4872798	4874212	4875626	4877039	4878451	4879863	4881275	4882686	4884097	1412
308	4885507	4886917	4888326	4889735	4891144	4892552	4893959	4895366	4896773	4898179	1408
309	4899585	4900990	4902395	4903799	4905203	4906607	4908010	4909412	4910814	4912216	1404
310	4913617	4915018	4916418	4917818	4919217	4920616	4922015	4923413	4924810	4926207	1399
311	4927604	4929000	4930396	4931791	4933186	4934581	4935974	4937368	4938761	4940154	1395
312	4941546	4942938	4944329	4945720	4947110	4948500	4949890	4951279	4952667	4954056	1390
313	4955443	4956831	4958218	4959604	4960990	4962375	4963761	4965145	4966529	4967913	1385
314	4969296	4970679	4972062	4973444	4974825	4976206	4977587	4978967	4980347	4981727	1381
315	4983106	4984484	4985862	4987240	4988617	4989994	4991370	4992746	4994121	4995496	1377
316	4996871	4998245	4999619	5000992	5002365	5003737	5005109	5006481	5007852	5009222	1372
317	5010593	5011962	5013332	5014701	5016069	5017437	5018805	5020172	5021539	5022905	1368
318	5024271	5025637	5027002	5028366	5029731	5031094	5032458	5033821	5035183	5036545	1363
319	5037907	5039268	5040629	5041989	5043349	5044709	5046068	5047426	5048785	5050142	1360
320	5051500	5052857	5054213	5055569	5056925	5058280	5059635	5060990	5062344	5063697	1355
321	5065050	5066403	5067755	5069107	5070459	5071810	5073160	5074511	5075860	5077210	1351
322	5078559	5079907	5081255	5082603	5083950	5085297	5086644	5087990	5089335	5090680	1347
323	5092025	5093370	5094714	5096057	5097400	5098743	5100085	5101427	5102768	5104109	1343
324	5105450	5106790	5108130	5109469	5110808	5112147	5113485	5114823	5116160	5117497	1339
325	5118834	5120170	5121505	5122841	5124175	5125510	5126844	5128178	5129511	5130844	1335
326	5132176	5133508	5134840	5136171	5137502	5138832	5140162	5141491	5142820	5144149	1330
327	5145478	5146805	5148133	5149460	5150787	5152113	5153439	5154764	5156089	5157414	1326
328	5158738	5160062	5161386	5162709	5164031	5165354	5166676	5167997	5169318	5170639	1323
329	5171959	5173279	5174598	5175917	5177236	5178554	5179872	5181189	5182507	5183823	1318
330	5185139	5186455	5187771	5189086	5190400	5191715	5193028	5194342	5195655	5196968	1315
331	5198280	5199592	5200903	5202214	5203525	5204835	5206145	5207455	5208764	5210073	1310
332	5211381	5212689	5213996	5215303	5216610	5217916	5219222	5220528	5221833	5223138	1306
333	5224442	5225746	5227050	5228353	5229656	5230958	5232260	5233562	5234863	5236164	1302
334	5237465	5238765	5240064	5241364	5242663	5243961	5245259	5246557	5247854	5249151	1298
335	5250448	5251744	5253040	5254336	5255631	5256925	5258220	5259513	5260807	5262100	1294
336	5263393	5264685	5265977	5267269	5268560	5269851	5271141	5272431	5273721	5275010	1291
337	5276299	5277588	5278876	5280163	5281451	5282738	5284024	5285311	5286596	5287882	1287
338	5289167	5290452	5291736	5293020	5294304	5295587	5296870	5298152	5299434	5300716	1283
339	5301997	5303278	5304558	5305839	5307118	5308398	5309677	5310955	5312234	5313512	1280
340	5314789	5316066	5317343	5318619	5319896	5321171	5322446	5323721	5324996	5326270	1275
341	5327544	5328817	5330090	5331363	5332635	5333907	5335179	5336450	5337721	5338991	1272
342	5340261	5341531	5342800	5344069	5345338	5346606	5347874	5349141	5350408	5351675	1268
343	5352941	5354207	5355473	5356738	5358003	5359267	5360532	5361795	5363059	5364322	1264
344	5365584	5366847	5368109	5369370	5370631	5371892	5373153	5374413	5375673	5376932	1261
345	5378191	5379450	5380708	5381966	5383223	5384481	5385737	5386994	5388250	5389506	1258
346	5390761	5392016	5393271	5394525	5395779	5397032	5398286	5399538	5400791	5402043	1253
347	5403295	5404546	5405797	5407048	5408298	5409548	5410798	5412047	5413296	5414544	1250
348	5415792	5417040	5418288	5419535	5420781	5422028	5423274	5424519	5425765	5427010	1247
349	5428254	5429498	5530742	5431986	5433229	5434472	5435714	5436956	5438198	5439439	1243

TABLE of Logarithms.

N°	0	1	2	3	4	5	6	7	8	9	Diff.
350	5440680	5441921	5443161	5444401	5445641	5446880	5448119	5449358	5450596	5451834	1239
351	5453071	5454308	5455545	5456781	5458018	5459253	5460489	5461724	5462958	5464193	1235
352	5465427	5466660	5467894	5469126	5470359	5471591	5472823	5474055	5475286	5476517	1232
353	5477747	5478977	5480207	5481436	5482665	5483894	5485123	5486351	5487578	5488806	1229
354	5490033	5491259	5492486	5493712	5494937	5496162	5497387	5498612	5499836	5501060	1225
355	5502284	5503507	5504730	5505952	5507174	5508396	5509618	5510839	5512059	5513280	1222
356	5514500	5515720	5516939	5518158	5519377	5520595	5521813	5523031	5524248	5525465	1218
357	5526682	5527899	5529115	5530330	5531545	5532760	5533975	5535189	5536403	5537617	1215
358	5538830	5540043	5541256	5542468	5543680	5544892	5546103	5547314	5548524	5549735	1212
359	5550944	5552154	5553363	5554572	5555781	5556989	5558197	5559404	5560612	5561818	1208
360	5563025	5564231	5565437	5566643	5567848	5569053	5570257	5571461	5572665	5573869	1205
361	5575072	5576275	5577477	5578680	5579881	5581083	5582284	5583485	5584686	5585886	1202
362	5587086	5588285	5589484	5590683	5591882	5593080	5594278	5595476	5596673	5597870	1198
363	5599066	5600262	5601458	5602654	5603849	5605044	5606239	5607433	5608627	5609821	1195
364	5611014	5612207	5613399	5614592	5615784	5616975	5618167	5619358	5620548	5621739	1193
365	5622929	5624118	5625308	5626497	5627685	5628874	5630062	5631250	5632437	5633624	1187
366	5634811	5635997	5637183	5638369	5639555	5640740	5641925	5643109	5644293	5645477	1185
367	5546661	5647844	5649027	5650209	5651392	5652573	5653755	5654936	5656117	5657298	1181
368	5658478	5659658	5660838	5662017	5663196	5664375	5665553	5666731	5667909	5669087	1179
369	5670264	5671440	5672617	5673793	5674969	5676144	5677320	5678495	5679669	5680843	1175
370	5682017	5683191	5684364	5685537	5686710	5687882	5689054	5690226	5691397	5692568	1172
371	5693739	5694910	5696080	5697249	5698419	5699588	5700757	5701926	5703094	5704262	1169
372	5705429	5706597	5707764	5708930	5710097	5711263	5712429	5713594	5714759	5715924	1166
373	5717088	5718252	5719416	5720580	5721743	5722906	5724069	5725231	5726393	5727555	1163
374	5728716	5729877	5731038	5732198	5733358	5734518	5735678	5736837	5737996	5739154	1160
375	5740313	5741471	5742628	5743786	5744943	5746099	5747256	5748412	5749568	5750723	1156
376	5751878	5753033	5754188	5755342	5756496	5757650	5758803	5759956	5761109	5762261	1154
377	5763414	5764565	5765717	5766868	5768019	5769170	5770320	5771470	5772620	5773769	1151
378	5774918	5776067	5777215	5778363	5779511	5780659	5781806	5782953	5784100	5785246	1148
379	5786392	5787538	5788683	5789828	5790973	5792118	5793262	5794406	5795550	5796693	1145
380	5797836	5798979	5800121	5801263	5802405	5803547	5804688	5805829	5806969	5808110	1142
381	5809250	5810389	5811529	5812668	5813807	5814945	5816084	5817222	5818359	5819497	1138
382	5820634	5821770	5822907	5824043	5825179	5826314	5827450	5828585	5829719	5830854	1135
383	5831988	5833122	5834255	5835388	5836521	5837654	5838786	5839918	5841050	5842181	1133
384	5843312	5844443	5845574	5846704	5847834	5848963	5850093	5851222	5852351	5853479	1129
385	5854607	5855735	5856863	5857990	5859117	5860244	5861370	5862496	5863622	5864748	1127
386	5865873	5866998	5868123	5869247	5870371	5871495	5872618	5873742	5874865	5875987	1124
387	5877110	5878232	5879353	5880475	5881596	5882717	5883838	5884958	5886078	5887198	1121
388	5888317	5889436	5890555	5891674	5892792	5893910	5895028	5896145	5897263	5898379	1118
389	5899496	5900612	5901728	5902844	5903959	5905075	5906189	5907304	5908418	5909532	1116
390	5910646	5911760	5912873	5913986	5915098	5916210	5917322	5918434	5919546	5920657	1112
391	5921768	5922878	5923988	5925098	5926208	5927318	5928427	5929536	5930644	5931753	1110
392	5932861	5933968	5935076	5936183	5937290	5938397	5939503	5940609	5941715	5942820	1107
393	5943926	5945032	5946135	5947239	5948344	5949447	5950551	5951654	5952757	5953860	1103
394	5954962	5956064	5957166	5958268	5959369	5960470	5961571	5962671	5963771	5964871	1101
395	5965971	5967070	5968169	5969268	5970367	5971465	5972563	5973661	5974758	5975855	1099
396	5976952	5978048	5979145	5980241	5981336	5982432	5983527	5984622	5985717	5986811	1096
397	5987905	5988999	5990092	5991186	5992279	5993371	5994464	5995556	5996648	5997739	1092
398	5998831	5999922	6001013	6002103	6003193	6004283	6005373	6006462	6007551	6008640	1090
399	6009729	6010817	6011905	6012993	6014081	6015168	6016255	6017341	6018428	6019514	1087

TABLE of Logarithms.

N°	0	1	2	3	4	5	6	7	8	9	Diff.
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401	6031444	6032527	6033609	6034692	6035774	6036855	6037937	6039018	6040099	6041180	1081
402	6042261	6043341	6044421	6045500	6046580	6047659	6048738	6049816	6050895	6051973	1079
403	6053050	6054128	6055205	6056282	6057359	6058435	6059512	6060587	6061663	6062739	1076
404	6063814	6064889	6065963	6067037	6068111	6069185	6070259	6071332	6072405	6073478	1074
405	6074550	6075622	6076694	6077766	6078837	6079909	6080979	6082050	6083120	6084191	1072
406	6085260	6086330	6087399	6088468	6089537	6090605	6091674	6092742	6093809	6094877	1068
407	6095944	6097011	6098078	6099144	6100210	6101276	6102342	6103407	6104472	6105537	1066
408	6106602	6107666	6108730	6109794	6110857	6111921	6112984	6114046	6115109	6116171	1064
409	6117233	6118295	6119356	6120417	6121478	6122539	6123599	6124660	6125720	6126779	1061
410	6127839	6128898	6129957	6131015	6132074	6133132	6134189	6135247	6136304	6137361	1058
411	6138418	6139475	6140531	6141587	6142643	6143698	6144754	6145809	6146863	6147918	1055
412	6148972	6150026	6151080	6152133	6153187	6154240	6155292	6156345	6157397	6158449	1053
413	6159501	6160552	6161603	6162654	6163705	6164755	6165805	6166855	6167905	6168954	1050
414	6170003	6171052	6172101	6173149	6174197	6175245	6176293	6177340	6178387	6179434	1048
415	6180481	6181527	6182573	6183619	6184665	6185710	6186755	6187800	6188845	6189889	1045
416	6190933	6191977	6193021	6194064	6195107	6196150	6197193	6198235	6199277	6200319	1043
417	6201361	6202402	6203443	6204484	6205524	6206565	6207605	6208645	6209684	6210724	1041
418	6211763	6212802	6213840	6214879	6215917	6216955	6217992	6219030	6220067	6221104	1038
419	6222140	6223177	6224213	6225249	6226284	6227320	6228355	6229390	6230424	6231459	1036
420	6232493	6233527	6234560	6235594	6236627	6237660	6238693	6239725	6240757	6241789	1033
421	6242821	6243852	6244884	6245915	6246945	6247976	6249006	6250036	6251066	6252095	1031
422	6253125	6254154	6255182	6256211	6257239	6258267	6259295	6260322	6261350	6262377	1028
423	6263404	6264430	6265457	6266483	6267509	6268534	6269560	6270585	6271610	6272634	1025
424	6273659	6274683	6275707	6276730	6277754	6278777	6279800	6280823	6281845	6282867	1023
425	6283889	6284911	6285933	6286954	6287975	6288996	6290016	6291037	6292057	6293076	1021
426	6294096	6295115	6296134	6297153	6298172	6299190	6300209	6301226	6302244	6303262	1018
427	6304279	6305296	6306312	6307329	6308345	6309361	6310377	6311393	6312408	6313423	1016
428	6314438	6315452	6316467	6317481	6318495	6319508	6320522	6321535	6322548	6323560	1013
429	6324573	6325585	6326597	6327609	6328620	6329632	6330643	6331654	6332664	6333674	1011
430	6334685	6335694	6336704	6337713	6338723	6339732	6340740	6341749	6342757	6343765	1009
431	6344773	6345780	6346788	6347795	6348801	6349808	6350814	6351820	6352826	6353832	1007
432	6354837	6355843	6356848	6357852	6358857	6359861	6360865	6361869	6362873	6363876	1004
433	6364879	6365882	6366884	6367887	6368889	6369891	6370893	6371894	6372895	6373897	1002
434	6374897	6375898	6376898	6377898	6378898	6379898	6380897	6381896	6382895	6383894	1000
435	6384893	6385891	6386889	6387887	6388884	6389882	6390879	6391876	6392872	6393869	998
436	6394865	6395861	6396857	6397852	6398847	6399842	6400837	6401832	6402826	6403820	995
437	6404814	6405808	6406802	6407795	6408788	6409781	6410773	6411765	6412758	6413749	993
438	6414741	6415733	6416724	6417715	6418705	6419696	6420686	6421676	6422666	6423656	991
439	6424645	6425634	6426623	6427612	6428601	6429589	6430577	6431565	6432552	6433540	988
440	6434527	6435514	6436500	6437487	6438473	6439459	6440445	6441431	6442416	6443401	986
441	6444386	6445371	6446355	6447339	6448323	6449307	6450291	6451274	6452257	6453240	984
442	6454223	6455205	6456187	6457169	6458151	6459133	6460114	6461095	6462076	6463057	982
443	6464037	6465018	6465998	6466977	6467957	6468936	6469915	6470894	6471873	6472851	979
444	6473830	6474808	6475786	6476763	6477741	6478718	6479695	6480671	6481648	6482624	977
445	6483600	6484576	6485552	6486527	6487502	6488477	6489452	6490426	6491401	6492375	975
446	6493349	6494322	6495296	6496269	6497242	6498215	6499187	6500160	6501132	6502104	973
447	6503075	6504047	6505018	6505989	6506960	6507930	6508901	6509871	6510841	6511811	970
448	6512780	6513749	6514719	6515687	6516656	6517624	6518593	6519561	6520528	6521496	968
449	6522463	6523431	6524397	6525364	6526331	6527297	6528263	6529229	6530195	6531160	966

Table of Logarithms.

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451	6541765	6542728	6543691	6544653	6545616	6546578	6547539	6548501	6549462	6550423	962
452	6551384	6552345	6553306	6554266	6555226	6556186	6557145	6558105	6559064	6560023	960
453	6560982	6561941	6562899	6563857	6564815	6565773	6566730	6567688	6568645	6569602	958
454	6570559	6571515	6572471	6573427	6574383	6575339	6576294	6577250	6578205	6579159	956
455	6580114	6581068	6582023	6582977	6583930	6584884	6585837	6586790	6587743	6588696	954
456	6589648	6590601	6591553	6592505	6593456	6594408	6595359	6596310	6597261	6598212	952
457	6599162	6600112	6601062	6602012	6602962	6603911	6604860	6605809	6606758	6607706	949
458	6608655	6609603	6610551	6611499	6612446	6613393	6614341	6615287	6616234	6617181	947
459	6618127	6619073	6620019	6620964	6621910	6622855	6623800	6624745	6625690	6626634	945
460	6627578	6628522	6629466	6630410	6631353	6632296	6633239	6634182	6635125	6636067	943
461	6637009	6637951	6638893	6639835	6640776	6641717	6642658	6643599	6644539	6645480	941
462	6646420	6647360	6648299	6649239	6650178	6651117	6652056	6652995	6653934	6654872	939
463	6655810	6656748	6657686	6658623	6659560	6660497	6661434	6662371	6663307	6664244	937
464	6665180	6666116	6667051	6667987	6668922	6669857	6670792	6671727	6672661	6673595	935
465	6674530	6675463	6676397	6677331	6678264	6679197	6680130	6681062	6681995	6682927	933
466	6683859	6684791	6685723	6686654	6687585	6688516	6689447	6690378	6691308	6692239	931
467	6693169	6694099	6695028	6695958	6696887	6697816	6698745	6699674	6700602	6701530	929
468	6702459	6703386	6704314	6705242	6706169	6707096	6708023	6708950	6709876	6710802	927
469	6711728	6712654	6713580	6714506	6715431	6716356	6717281	6718206	6719130	6720054	925
470	6720979	6721903	6722826	6723750	6724673	6725596	6726519	6727442	6728365	6729287	923
471	6730209	6731131	6732053	6732974	6733896	6734817	6735738	6736659	6737579	6738500	921
472	6739420	6740340	6741260	6742179	6743099	6744018	6744937	6745856	6746775	6747693	919
473	6748611	6749529	6750447	6751365	6752283	6753200	6754117	6755034	6755951	6756867	917
474	6757783	6758700	6759615	6760531	6761447	6762362	6763277	6764192	6765107	6766022	915
475	6766936	6767850	6768764	6769678	6770592	6771505	6772418	6773332	6774244	6775157	913
476	6776070	6776982	6777894	6778806	6779718	6780629	6781540	6782452	6783362	6784273	911
477	6785184	6786094	6787004	6787914	6788824	6789734	6790643	6791552	6792461	6793370	910
478	6794279	6795187	6796096	6797004	6797912	6798819	6799727	6800634	6801541	6802448	908
479	6803355	6804262	6805168	6806074	6806980	6807886	6808792	6809697	6810602	6811507	906
480	6812412	6813317	6814222	6815126	6816030	6816934	6817838	6818741	6819645	6820548	904
481	6821451	6822354	6823256	6824159	6825061	6825963	6826865	6827766	6828668	6829569	902
482	6830470	6831371	6832272	6833173	6834073	6834973	6835873	6836773	6837673	6838572	900
483	6839471	6840370	6841269	6842168	6843066	6843965	6844863	6845761	6846659	6847556	899
484	6848454	6849351	6850248	6851145	6852041	6852938	6853834	6854730	6855626	6856522	897
485	6857417	6858313	6859208	6860103	6860998	6861892	6862787	6863681	6864575	6865469	894
486	6866363	6867256	6868150	6869043	6869936	6870828	6871721	6872613	6873506	6874398	892
487	6875290	6876181	6877073	6877964	6878855	6879746	6880637	6881528	6882418	6883308	891
488	6884198	6885088	6885978	6886867	6887757	6888646	6889535	6890423	6891312	6892200	889
489	6893089	6893977	6894864	6895752	6896640	6897527	6898414	6899301	6900188	6901074	887
490	6901961	6902847	6903733	6904619	6905505	6906390	6907275	6908161	6909046	6909930	885
491	6910815	6911699	6912584	6913468	6914352	6915235	6916119	6917002	6917885	6918768	883
492	6919651	6920534	6921416	6922298	6923180	6924062	6924944	6925826	6926707	6927588	882
493	6928469	6929350	6930231	6931111	6931991	6932872	6933752	6934631	6935511	6936390	881
494	6937269	6938149	6939027	6939906	6940785	6941663	6942541	6943419	6944297	6945175	878
495	6946052	6946929	6947806	6948683	6949560	6950437	6951313	6952189	6953065	6953941	877
496	6954817	6955692	6956568	6957443	6958318	6959193	6960067	6960942	6961816	6962690	875
497	6963564	6964438	6965311	6966185	6967058	6967931	6968804	6969676	6970549	6971421	873
498	6972293	6973165	6974037	6974909	6975780	6976652	6977523	6978394	6979264	6980135	872
499	6981005	6981876	6982746	6983616	6984485	6985355	6986224	6987093	6987963	6988831	870

TABLE of Logarithms.

N	0	1	2	3	4	5	6	7	8	9	Diff.
500	6989700	6990569	6991437	6992305	6993173	6994041	6994908	6995776	6996643	6997510	868
501	6998377	6999244	7000111	7000977	7001843	7002709	7003575	7004441	7005307	7006172	866
502	7007037	7007902	7008767	7009632	7010496	7011361	7012225	7013089	7013953	7014816	865
503	7015680	7016543	7017406	7018269	7019132	7019995	7020857	7021720	7022582	7023444	863
504	7024305	7025167	7026028	7026890	7027751	7028612	7029472	7030333	7031193	7032054	861
505	7032914	7033774	7034633	7035493	7036352	7037212	7038071	7038930	7039788	7040647	860
506	7041505	7042363	7043221	7044079	7044937	7045794	7046652	7047509	7048366	7049223	857
507	7050080	7050936	7051792	7052649	7053505	7054360	7055216	7056072	7056927	7057782	855
508	7058637	7059492	7060347	7061201	7062055	7062910	7063764	7064617	7065471	7066325	854
509	7067178	7068031	7068884	7069737	7070589	7071442	7072294	7073146	7073998	7074850	853
510	7075702	7076553	7077405	7078256	7079107	7079957	7080808	7081659	7082509	7083359	850
511	7084209	7085059	7085908	7086758	7087607	7088456	7089305	7090154	7091003	7091851	849
512	7092700	7093548	7094396	7095244	7096091	7096939	7097786	7098633	7099480	7100327	848
513	7101174	7102020	7102866	7103713	7104559	7105404	7106250	7107096	7107941	7108786	845
514	7109631	7110476	7111321	7112165	7113010	7113854	7114698	7115542	7116385	7117229	844
515	7118072	7118915	7119759	7120601	7121444	7122287	7123129	7123971	7124813	7125655	843
516	7126497	7127339	7128180	7129021	7129862	7130703	7131544	7132385	7133225	7134065	841
517	7134905	7135745	7136585	7137425	7138264	7139104	7139943	7140782	7141620	7142459	840
518	7143298	7144136	7144974	7145812	7146650	7147488	7148325	7149162	7150000	7150837	838
519	7151674	7152510	7153347	7154183	7155019	7155856	7156691	7157527	7158363	7159198	837
520	7160033	7160869	7161703	7162538	7163373	7164207	7165042	7165876	7166710	7167544	834
521	7168377	7169211	7170044	7170877	7171710	7172543	7173376	7174208	7175041	7175873	833
522	7176705	7177537	7178369	7179200	7180032	7180863	7181694	7182525	7183356	7184186	831
523	7185017	7185847	7186677	7187507	7188337	7189167	7189996	7190826	7191655	7192484	830
524	7193313	7194142	7194970	7195799	7196627	7197455	7198283	7199111	7199938	7200766	828
525	7201593	7202420	7203247	7204074	7204901	7205727	7206554	7207380	7208206	7209032	826
526	7209857	7210683	7211508	7212334	7213159	7213984	7214809	7215633	7216458	7217282	825
527	7218106	7218930	7219754	7220578	7221401	7222225	7223048	7223871	7224694	7225517	824
528	7226339	7227162	7227984	7228806	7229628	7230450	7231272	7232093	7232914	7233736	822
529	7234557	7235378	7236198	7237019	7237839	7238660	7239480	7240300	7241120	7241939	821
530	7242759	7243578	7244397	7245216	7246035	7246854	7247672	7248491	7249309	7250127	820
531	7250945	7251763	7252581	7253398	7254216	7255033	7255850	7256667	7257483	7258300	817
532	7259116	7259933	7260749	7261565	7262380	7263196	7264012	7264827	7265642	7266457	816
533	7267272	7268087	7268901	7269716	7270530	7271344	7272158	7272972	7273786	7274599	814
534	7275413	7276226	7277039	7277852	7278664	7279477	7280290	7281102	7281914	7282726	813
535	7283538	7284350	7285161	7285972	7286784	7287595	7288406	7289216	7290027	7290838	811
536	7291648	7292458	7293268	7294078	7294888	7295697	7296507	7297316	7298125	7298934	809
537	7299743	7300552	7301360	7302168	7302977	7303785	7304593	7305400	7306208	7307015	808
538	7307823	7308630	7309437	7310244	7311051	7311857	7312663	7313470	7314276	7315082	806
539	7315888	7316693	7317499	7318304	7319109	7319914	7320719	7321524	7322329	7323133	805
540	7323938	7324742	7325546	7326350	7327153	7327957	7328760	7329564	7330367	7331170	804
541	7331973	7332775	7333578	7334380	7335183	7335985	7336787	7337588	7338390	7339192	802
542	7339993	7340794	7341595	7342396	7343197	7343997	7344798	7345598	7346398	7347198	800
543	7347998	7348798	7349598	7350397	7351196	7351995	7352794	7353593	7354392	7355191	799
544	7355989	7356787	7357585	7358383	7359181	7359979	7360776	7361574	7362371	7363168	798
545	7363965	7364762	7365558	7366355	7367151	7367948	7368744	7369540	7370335	7371131	797
546	7371926	7372722	7373517	7374312	7375107	7375902	7376696	7377491	7378285	7379079	795
547	7379873	7380667	7381461	7382254	7383048	7383841	7384634	7385427	7386220	7387013	793
548	7387806	7388598	7389390	7390182	7390974	7391766	7392558	7393350	7394141	7394932	702
549	7395723	7396514	7397305	7398096	7398887	7399677	7400467	7401257	7402047	7402837	790

TABLE of Logarithms.

N	0	1	2	3	4	5	6	7	8	9	Dif.
550	7403627	7404416	7405206	7405995	7406784	7407573	7408362	7409151	7409939	7410728	789
551	7411516	7412304	7413092	7413880	7414668	7415455	7416243	7417030	7417817	7418604	787
552	7419391	7420177	7420964	7421750	7422537	7423323	7424109	7424895	7425680	7426466	786
553	7427251	7428037	7428822	7429607	7430392	7431176	7431961	7432745	7433530	7434314	784
554	7435098	7435882	7436665	7437449	7438232	7439016	7439799	7440582	7441365	7442147	783
555	7442930	7443712	7444495	7445277	7446059	7446841	7447622	7448404	7449185	7449967	782
556	7450748	7451529	7452310	7453091	7453871	7454652	7455432	7456212	7456992	7457772	781
557	7458552	7459332	7460111	7460890	7461670	7462449	7463228	7464006	7464785	7465564	779
558	7466342	7467120	7467898	7468676	7469454	7470232	7471009	7471787	7472564	7473341	778
559	7474118	7474895	7475672	7476448	7477225	7478001	7478777	7479553	7480329	7481105	776
560	7481880	7482656	7483431	7484206	7484981	7485756	7486531	7487306	7488080	7488854	775
561	7489629	7490403	7491177	7491950	7492724	7493498	7494271	7495044	7495817	7496590	774
562	7497363	7498136	7498908	7499681	7500453	7501225	7501997	7502769	7503541	7504312	772
563	7505084	7505855	7506626	7507398	7508168	7508939	7509710	7510480	7511251	7512021	771
564	7512791	7513561	7514331	7515101	7515870	7516639	7517409	7518178	7518947	7519716	769
565	7520484	7521253	7522022	7522790	7523558	7524326	7525094	7525862	7526629	7527397	768
566	7528164	7528932	7529699	7530466	7531232	7531999	7532766	7533532	7534298	7535065	767
567	7535831	7536596	7537362	7538128	7538893	7539659	7540424	7541189	7541954	7542719	766
568	7543483	7544248	7545012	7545777	7546541	7547305	7548069	7548832	7549596	7550359	764
569	7551123	7551886	7552649	7553412	7554175	7554937	7555700	7556462	7557224	7557987	762
570	7558749	7559510	7560272	7561034	7561795	7562556	7563318	7564079	7564840	7565600	761
571	7566361	7567122	7567882	7568642	7569402	7570162	7570992	7571682	7572442	7573201	760
572	7573960	7574719	7575479	7576237	7576996	7577755	7578513	7579272	7580030	7580788	759
573	7581546	7582304	7583062	7583819	7584577	7585334	7586091	7586848	7587605	7588362	757
574	7589119	7589875	7590632	7591388	7592144	7592900	7593656	7594412	7595168	7595923	756
575	7596678	7597434	7598189	7598944	7599699	7600453	7601208	7601962	7602717	7603471	754
576	7604225	7604979	7605733	7606486	7607240	7607993	7608746	7609500	7610253	7611005	753
577	7611758	7612511	7613263	7614016	7614768	7615520	7616272	7617024	7617775	7618527	752
578	7619278	7620030	7620781	7621532	7622283	7623034	7623784	7624535	7625285	7626035	751
579	7626786	7627536	7628286	7629035	7629785	7630534	7631284	7632033	7632782	7633531	749
580	7634280	7635029	7635777	7636526	7637274	7638022	7638770	7639518	7640266	7641014	748
581	7641761	7642509	7643256	7644003	7644750	7645497	7646244	7646991	7647737	7648484	747
582	7649230	7649976	7650722	7651468	7652214	7652959	7653705	7654450	7655195	7655941	745
583	7656686	7657430	7658175	7658920	7659664	7660409	7661153	7661897	7662641	7663385	744
584	7664128	7664872	7665616	7666359	7667102	7667845	7668588	7669331	7670074	7670816	743
585	7671559	7672301	7673043	7673785	7674527	7675269	7676011	7676752	7677494	7678235	742
586	7678976	7679717	7680458	7681199	7681940	7682680	7683421	7684161	7684901	7685641	740
587	7686381	7687121	7687860	7688600	7689339	7690079	7690818	7691557	7692296	7693035	739
588	7693773	7694512	7695250	7695988	7696727	7697465	7698203	7698940	7699678	7700416	738
589	7701153	7701890	7702627	7703364	7704101	7704838	7705575	7706311	7707048	7707784	737
590	7708520	7709256	7709992	7710728	7711463	7712199	7712934	7713670	7714405	7715140	735
591	7715875	7716610	7717344	7718079	7718813	7719547	7720282	7721016	7721750	7722483	734
592	7723217	7723951	7724684	7725417	7726150	7726884	7727616	7728349	7729082	7729815	733
593	7730547	7731279	7732011	7732743	7733475	7734207	7734939	7735670	7736402	7737133	732
594	7737864	7738596	7739326	7740057	7740788	7741519	7742249	7742979	7743710	7744440	731
595	7745170	7745900	7746629	7747359	7748088	7748818	7749547	7750276	7751005	7751734	729
596	7752463	7753191	7753920	7754648	7755376	7756104	7756832	7757560	7758288	7759010	728
597	7759743	7760471	7761198	7761925	7762652	7763379	7764106	7764833	7765559	7766286	727
598	7767012	7767738	7768464	7769190	7769916	7770642	7771367	7772093	7772818	7773543	726
599	7774268	7774993	7775718	7776443	7777167	7777892	7778616	7779340	7780065	7780789	724

TABLE of Logarithms.

N°	0	1	2	3	4	5	6	7	8	9	Diff.
600	7781513	7782236	7782960	7783683	7784407	7785130	7785853	7786576	7787299	7788022	723
601	7788745	7789467	7790190	7790912	7791634	7792356	7793078	7793800	7794522	7795243	722
602	7795965	7796686	7797408	7798129	7798850	7799571	7800291	7801012	7801732	7802453	721
603	7803173	7803893	7804613	7805333	7806053	7806773	7807492	7808212	7808931	7809650	720
604	7810369	7811088	7811807	7812526	7813245	7813963	7814681	7815400	7816118	7816836	718
605	7817554	7818272	7818989	7819707	7820424	7821141	7821859	7822576	7823293	7824010	717
606	7824726	7825443	7826159	7826876	7827592	7828308	7829024	7829740	7830456	7831171	716
607	7831887	7832602	7833318	7834033	7834748	7835463	7836178	7836892	7837607	7838321	715
608	7839036	7839750	7840464	7841178	7841892	7842606	7843319	7844033	7844746	7845460	714
609	7846173	7846886	7847599	7848312	7849024	7849737	7850450	7851162	7851874	7852586	713
610	7853298	7854010	7854722	7855434	7856145	7856857	7857568	7858279	7858990	7859701	712
611	7860412	7861123	7861833	7862544	7863254	7863965	7864675	7865385	7866095	7866805	711
612	7867514	7868224	7868933	7869643	7870352	7871061	7871770	7872479	7873188	7873896	709
613	7874605	7875313	7876021	7876730	7877438	7878146	7878854	7879561	7880269	7880976	708
614	7881684	7882391	7883098	7883805	7884512	7885219	7885926	7886632	7887339	7888045	707
615	7888751	7889457	7890163	7890869	7891575	7892281	7892986	7893692	7894397	7895102	706
616	7895807	7896512	7897217	7897922	7898626	7899331	7900035	7900739	7901444	7902148	705
617	7902852	7903555	7904259	7904963	7905666	7906370	7907073	7907776	7908479	7909182	704
618	7909885	7910587	7911290	7911992	7912695	7913397	7914099	7914801	7915503	7916205	702
619	7916906	7917608	7918309	7919011	7919712	7920413	7921114	7921815	7922516	7923216	701
620	7923917	7924617	7925318	7926018	7926718	7927418	7928118	7928817	7929517	7930217	700
621	7930916	7931615	7932314	7933014	7933712	7934411	7935110	7935809	7936507	7937206	699
622	7937904	7938602	7939300	7939998	7940696	7941394	7942091	7942789	7943486	7944183	698
623	7944880	7945578	7946274	7946971	7947668	7948365	7949061	7949757	7950454	7951150	697
624	7951846	7952542	7953238	7953933	7954629	7955324	7956020	7956715	7957410	7958105	695
625	7958800	7959495	7960190	7960884	7961579	7962273	7962967	7963662	7964356	7965050	694
626	7965743	7966437	7967131	7967824	7968517	7969211	7969904	7970597	7971290	7971983	693
627	7972675	7973368	7974060	7974753	7975445	7976137	7976829	7977521	7978213	7978905	692
628	7979596	7980288	7980979	7981671	7982362	7983053	7983744	7984435	7985125	7985816	691
629	7986506	7987197	7987887	7988577	7989267	7989957	7990647	7991337	7992027	7992716	690
630	7993405	7994095	7994784	7995473	7996162	7996851	7997540	7998228	7998917	7999605	689
631	8000294	8000982	8001670	8002358	8003046	8003734	8004421	8005109	8005796	8006484	688
632	8007171	8007858	8008545	8009232	8009919	8010605	8011292	8011978	8012665	8013351	687
633	8014037	8014723	8015409	8016095	8016781	8017466	8018152	8018837	8019522	8020208	685
634	8020893	8021578	8022262	8022947	8023632	8024316	8025001	8025685	8026369	8027053	684
635	8027737	8028421	8029105	8029789	8030472	8031156	8031839	8032522	8033205	8033888	683
636	8034571	8035254	8035937	8036619	8037302	8037984	8038666	8039348	8040031	8040712	682
637	8041394	8042076	8042758	8043439	8044121	8044802	8045483	8046164	8046845	8047526	681
638	8048207	8048887	8049568	8050248	8050929	8051609	8052289	8052969	8053649	8054329	680
639	8055009	8055688	8056368	8057047	8057726	8058405	8059085	8059764	8060442	8061121	679
640	8061800	8062478	8063157	8063835	8064513	8065191	8065869	8066547	8067225	8067903	678
641	8068580	8069258	8069935	8070612	8071290	8071967	8072644	8073320	8073997	8074674	677
642	8075350	8076027	8076703	8077379	8078055	8078731	8079407	8080083	8080759	8081434	676
643	8082110	8082785	8083460	8084136	8084811	8085486	8086160	8086835	8087510	8088184	675
644	8088859	8089533	8090207	8090881	8091555	8092229	8092903	8093577	8094250	8094924	674
645	8095597	8096270	8096944	8097617	8098290	8098962	8099635	8100308	8100980	8101653	673
646	8102325	8102997	8103670	8104342	8105013	8105685	8106357	8107029	8107700	8108372	672
647	8109043	8109714	8110385	8111056	8111727	8112398	8113068	8113739	8114409	8115080	671
648	8115750	8116420	8117090	8117760	8118430	8119100	8119769	8120439	8121108	8121778	670
649	8122447	8123116	8123785	8124454	8125123	8125792	8126460	8127129	8127797	8128465	669

TABLE of Logarithms.

N°	0	1	2	3	4	5	6	7	8	9	Diff.
650	8129134	8129802	8130470	8131138	8131805	8132473	8133141	8133808	8134475	8135143	668
651	8135810	8136477	8137144	8137811	8138478	8139144	8139811	8140477	8141144	8141810	666
652	8142476	8143142	8143808	8144474	8145140	8145805	8146471	8147136	8147801	8148467	665
653	8149132	8149797	8150462	8151127	8151791	8152456	8153120	8153785	8154449	8155113	665
654	8155777	8156441	8157105	8157769	8158433	8159097	8159760	8160423	8161087	8161750	664
655	8162413	8163076	8163739	8164402	8165064	8165727	8166389	8167052	8167714	8168376	663
656	8169038	8169700	8170362	8171024	8171686	8172347	8173009	8173670	8174331	8174993	662
657	8175654	8176315	8176976	8177636	8178297	8178958	8179618	8180278	8180939	8181599	661
658	8182259	8182919	8183579	8184239	8184898	8185558	8186217	8186877	8187536	8188195	660
659	8188854	8189513	8190172	8190831	8191489	8192148	8192806	8193465	8194123	8194781	659
660	8195439	8196097	8196755	8197413	8198071	8198728	8199386	8200043	8200700	8201358	657
661	8202015	8202672	8203328	8203985	8204642	8205298	8205955	8206611	8207268	8207924	656
662	8208580	8209236	8209892	8210548	8211203	8211859	8212514	8213170	8213825	8214480	656
663	8215135	8215790	8216445	8217100	8217755	8218409	8219064	8219718	8220372	8221027	654
664	8221681	8222335	8222989	8223643	8224296	8224950	8225603	8226257	8226910	8227563	654
665	8228216	8228869	8229522	8230175	8230828	8231481	8232133	8232786	8233438	8234090	653
666	8234742	8235394	8236046	8236698	8237350	8238002	8238653	8239305	8239956	8240607	652
667	8241258	8241909	8242560	8243211	8243862	8244513	8245163	8245814	8246464	8247114	651
668	8247765	8248415	8249065	8249715	8250364	8251014	8251664	8252313	8252963	8253612	650
669	8254261	8254910	8255559	8256208	8256857	8257506	8258154	8258803	8259451	8260100	649
670	8260748	8261396	8262044	8262692	8263340	8263988	8264635	8265283	8265931	8266578	648
671	8267225	8267872	8268519	8269166	8269813	8270460	8271107	8271753	8272400	8273046	647
672	8273693	8274339	8274985	8275631	8276277	8276923	8277569	8278214	8278860	8279505	646
673	8280151	8280796	8281441	8282086	8282731	8283376	8284021	8284665	8285310	8285955	645
674	8286599	8287243	8287887	8288532	8289176	8289820	8290463	8291107	8291751	8292394	644
675	8293038	8293681	8294324	8294967	8295611	8296254	8296896	8297539	8298182	8298824	643
676	8299467	8300109	8300752	8301394	8302036	8302678	8303320	8303962	8304604	8305245	642
677	8305887	8306528	8307169	8307811	8308452	8309093	8309734	8310375	8311016	8311656	641
678	8312297	8312937	8313578	8314218	8314858	8315499	8316139	8316778	8317418	8318058	641
679	8318698	8319337	8319977	8320616	8321255	8321895	8322534	8323173	8323812	8324450	640
680	8325089	8325728	8326366	8327005	8327643	8328281	8328919	8329558	8330195	8330833	638
681	8331471	8332109	8332746	8333384	8334021	8334659	8335296	8335933	8336570	8337207	638
682	8337844	8338480	8339117	8339754	8340390	8341027	8341663	8342299	8342935	8343571	637
683	8344207	8344843	8345479	8346114	8346750	8347385	8348021	8348656	8349291	8349926	635
684	8350561	8351196	8351831	8352465	8353100	8353735	8354369	8355003	8355638	8356272	635
685	8356906	8357540	8358174	8358807	8359441	8360075	8360708	8361341	8361975	8362608	634
686	8363241	8363874	8364507	8365140	8365773	8366405	8367038	8367670	8368303	8368935	632
687	8369567	8370199	8370832	8371163	8372095	8372727	8373359	8373990	8374622	8375253	632
688	8375884	8376516	8377147	8377778	8378409	8379039	8379670	8380301	8380931	8381562	630
689	8382192	8382822	8383453	8384083	8384713	8385343	8385973	8386602	8387232	8387861	630
690	8388491	8389120	8389750	8390379	8391008	8391637	8392266	8392895	8393523	8394152	629
691	8394780	8395409	8396037	8396666	8397294	8397922	8398550	8399178	8399806	8300433	628
692	8401061	8401688	8402316	8402943	8403571	8404198	8404825	8405452	8406079	8406706	627
693	8407332	8407959	8408586	8409212	8409838	8410465	8411091	8411717	8412343	8412969	627
694	8413595	8414220	8414846	8415472	8416097	8416723	8417348	8417973	8418598	8419223	626
695	8419848	8420473	8421098	8421722	8422347	8422971	8423596	8424220	8424844	8425468	624
696	8426092	8426716	8427340	8427964	8428588	8429211	8429835	8430458	8431081	8431705	623
697	843232	8432951	8433574	8434197	8434819	8435442	8436065	8436687	8437310	8437932	623
698	8438554	8439176	8439798	8440420	8441042	8441664	8442286	8442907	8443529	8444150	622
699	8444772	8445393	8446014	8446635	8447256	8447877	8448498	8449119	8449739	8450360	621

TABLE of Logarithms.

N	0	1	2	3	4	5	6	7	8	9	Diff.
700	8450980	8451601	8452221	8452841	8453461	8454081	8454701	8455321	8455941	8456561	620
701	8457180	8457800	8458419	8459038	8459658	8460277	8460896	8461515	8462134	8462752	619
702	8463371	8463990	8464608	8465227	8465845	8466463	8467081	8467700	8468318	8468935	618
703	8469553	8470171	8470789	8471406	8472024	8472641	8473258	8473876	8474493	8475110	617
704	8475727	8476343	8476960	8477577	8478193	8478810	8479426	8480043	8480659	8481275	617
705	8481891	8482507	8483123	8483739	8484355	8484970	8485586	8486201	8486817	8487432	615
706	8488047	8488662	8489277	8489892	8490507	8491122	8491736	8492351	8492965	8493580	615
707	8494194	8494808	8495423	8496037	8496651	8497264	8497878	8498492	8499106	8499719	613
708	8500333	8500946	8501559	8502172	8502786	8503399	8504011	8504624	8505237	8505850	613
709	8506462	8507075	8507687	8508300	8508912	8509524	8510136	8510748	8511360	8511972	612
710	8512583	8513195	8513807	8514418	8515030	8515641	8516252	8516863	8517474	8518085	611
711	8518696	8519307	8519917	8520528	8521139	8521749	8522359	8522970	8523580	8524190	610
712	2524800	8525410	8526020	8526629	8527239	8527849	8528458	8529068	8529677	8530286	610
713	8530895	8531504	8532113	8532722	8533331	8533940	8534548	8535157	8535765	8536374	609
714	8536982	8537590	8538198	8538807	8539414	8540022	8540630	8541238	8541845	8542453	608
715	8543060	8543668	8544275	8544882	8545489	8546096	8546703	8547310	8547917	8548524	607
716	8549130	8549737	8550343	8550950	8551556	8552162	8552768	8553374	8553980	8554586	606
717	8555192	8555797	8556403	8557008	8557614	8558219	8558824	8559429	8560035	8560640	605
718	8561244	8561849	8562454	8563059	8563663	8564268	8564872	8565476	8566081	8566685	605
719	8567289	8567893	8568497	8569101	8569704	8570308	8570912	8571515	8572118	8572722	604
720	8573325	8573928	8574531	8575134	8575737	8576340	8576943	8577545	8578148	8578750	603
721	8579353	8579955	8580557	8581159	8581761	8582363	8582965	8583567	8584169	8584770	602
722	8585372	8585973	8586575	8587176	8587777	8588379	8588980	8589581	8590181	8590782	602
723	8591383	8591984	8592584	8593185	8593785	8594385	8594986	8595586	8596186	8596786	600
724	8597386	8597985	8598585	8599185	8599784	8600384	8600983	8601583	8602182	8602781	600
725	8603380	8603979	8604578	8605177	8605776	8606374	8606973	8607571	8608170	8608768	698
726	8609366	8609964	8610562	8611160	8611758	8612356	8612954	8613552	8614149	8614747	698
727	8615344	8615941	8616539	8617136	8617733	8618330	8618927	8619524	8620121	8620717	697
728	8621314	8621910	8622507	8623103	8623699	8624296	8624892	8625488	8626084	8626680	697
729	8627275	8627871	8628467	8629062	8629658	8630253	8630848	8631443	8632039	8632634	695
730	8633229	8633823	8634418	8635013	8635608	8636202	8636797	8637391	8637985	8638580	594
731	8639174	8639768	8640362	8640956	8641550	8642143	8642737	8643331	8643924	8644517	593
732	8645111	8645704	8646297	8646890	8647483	8648076	8648669	8649262	8649855	8650447	593
733	8651040	8651632	8652225	8652817	8653409	8654001	8654593	8655185	8655777	8656369	591
734	8656961	8657552	8658144	8658735	8659327	8659918	8660509	8661100	8661691	8662282	591
735	8662873	8663464	8664055	8664646	8665236	8665827	8666417	8667008	8667598	8668188	591
736	8668778	8669368	8669958	8670548	8671138	8671728	8672317	8672907	8673496	8674086	590
737	8674675	8675264	8675853	8676442	8677031	8677620	8678209	8678798	8679387	8679975	589
738	8680564	8681152	8681740	8682329	8682917	8683505	8684093	8684681	8685269	8685857	588
739	8686444	8687032	8687620	8688207	8688794	8689382	8689969	8690556	8691143	8691730	588
740	8692317	8692904	8693491	8694077	8694664	8695251	8695837	8696423	8697010	8697596	587
741	8698182	8698768	8699354	8699940	8700526	8701112	8701697	8702283	8702868	8703454	586
742	8704039	8704624	8705210	8705795	8706380	8706965	8707549	8708134	8708719	8709304	585
743	8709888	8710473	8711057	8711641	8712226	8712810	8713394	8713978	8714562	8715146	584
744	8715720	8716313	8716897	8717480	8718064	8718647	8719230	8719814	8720397	8720980	583
745	8721563	8722146	8722728	8723311	8723894	8724476	8725059	8725641	8726224	8726806	582
746	8727388	8727970	8728552	8729134	8729716	8730298	8730880	8731462	8732043	8732625	582
747	8733206	8733787	8734369	8734950	8735531	8736112	8736693	8737274	8737855	8738435	581
748	8739016	8739597	8740177	8740757	8741338	8741918	8742498	8743078	8743658	8744238	580
749	8744818	8745398	8745978	8746557	8747137	8747716	8748296	8748875	8749454	8750034	579

TABLE of Logarithms.

N°	0	1	2	3	4	5	6	7	8	9	Diff.
750	8750613	8751192	8751771	8752349	8752928	8753507	8754086	8754664	8755243	8755821	579
751	8756399	8756978	8757556	8758134	8758712	8759290	8759868	8760446	8761023	8761601	578
752	8762178	8762756	8763333	8763911	8764488	8765065	8765642	8766219	8766796	8767373	577
753	8767950	8768526	8769103	8769680	8770256	8770833	8771409	8771985	8772561	8773137	577
754	8773713	8774289	8774865	8775441	8776017	8776592	8777168	8777743	8778319	8778894	575
755	8779470	8780045	8780620	8781195	8781770	8782345	8782919	8783494	8784069	8784643	575
756	8785218	8785792	8786367	8786941	8787515	8788089	8788663	8789237	8789811	8790385	574
757	8790959	8791532	8792106	8792680	8793253	8793826	8794400	8794973	8795546	8796119	573
758	8796692	8797265	8797838	8798411	8798983	8799556	8800128	8800701	8801273	8801846	573
759	8802418	8802990	8803562	8804134	8804706	8805278	8805850	8806421	8806993	8807564	572
760	8808136	8808707	8809279	8809850	8810421	8810992	8811563	8812134	8812705	8813276	571
761	8813847	8814417	8814988	8815558	8816129	8816699	8817269	8817840	8818410	8818980	570
762	8819550	8820120	8820689	8821259	8821829	8822398	8822968	8823537	8824107	8824676	569
763	8825245	8825815	8826384	8826953	8827522	8828090	8828659	8829228	8829797	8830365	568
764	8830934	8831502	8832070	8832639	8833207	8833775	8834343	8834911	8835479	8836047	568
765	8836614	8837182	8837750	8838317	8838885	8839452	8840019	8840586	8841154	8841721	567
766	8842288	8842855	8843421	8843988	8844555	8845122	8845688	8846255	8846821	8847387	567
767	8847954	8848520	8849086	8849652	8850218	8850784	8851350	8851915	8852481	8853047	566
768	8853612	8854178	8854743	8855308	8855874	8856439	8857004	8857569	8858134	8858699	565
769	8859263	8859828	8860393	8860957	8861522	8862086	8862651	8863215	8863779	8864343	564
770	8864907	8865471	8866035	8866599	8867163	8867726	8868290	8868854	8869417	8869980	563
771	8870544	8871107	8871670	8872233	8872796	8873359	8873922	8874485	8875048	8875610	563
772	8876173	8876736	8877298	8877860	8878423	8878985	8879547	8880109	8880671	8881233	562
773	8881795	8882357	8882918	8883480	8884042	8884603	8885165	8885726	8886287	8886848	561
774	8887410	8887971	8888532	8889093	8889653	8890214	8890775	8891336	8891896	8892457	561
775	8893017	8893577	8894138	8894698	8895258	8895818	8896378	8896938	8897498	8898058	560
776	8898617	8899177	8899736	8900296	8900855	8901415	8901974	8902533	8903092	8903651	560
777	8904210	8904769	8905328	8905887	8906445	8907004	8907563	8908121	8908679	8909238	559
778	8909796	8910354	8910912	8911470	8912028	8912586	8913144	8913702	8914259	8914817	558
779	8915375	8915932	8916489	8917047	8917604	8918161	8918718	8919275	8919832	8920389	557
780	8920946	8921503	8922059	8922616	8923173	8923729	8924285	8924842	8925398	8925954	556
781	8926510	8927066	8927622	8928178	8928734	8929290	8929846	8930401	8930957	8931512	556
782	8932068	8932623	8933178	8933733	8934288	8934843	8935398	8935953	8936508	8937063	555
783	8937618	8938172	8938727	8939281	8939836	8940390	8940944	8941498	8942053	8942607	554
784	8943161	8943715	8944268	8944822	8945376	8945929	8946483	8947037	8947590	8948143	553
785	8948697	8949250	8949803	8950356	8950909	8951462	8952015	8952568	8953120	8953673	553
786	8954225	8954778	8955330	8955883	8956435	8956987	8957539	8958092	8958644	8959195	552
787	8959747	8960299	8960851	8961403	8961954	8962506	8963057	8963608	8964160	8964711	552
788	8965262	8965813	8966364	8966915	8967466	8968017	8968568	8969118	8969669	8970220	551
789	8970770	8971320	8971871	8972421	8972971	8973521	8974071	8974621	8975171	8975721	550
790	8976271	8976821	8977370	8977920	8978469	8979019	8979568	8980117	8980667	8981216	550
791	8981765	8982314	8982863	8983412	8983960	8984509	8985058	8985606	8986155	8986703	549
792	8987252	8987800	8988348	8988897	8989445	8989993	8990541	8991089	8991636	8992184	548
793	8992732	8993279	8993827	8994375	8994922	8995469	8996017	8996564	8997111	8997658	547
794	8998205	8998752	8999299	8999846	9000392	9000939	9001486	9002032	9002579	9003125	547
795	9003671	9004218	9004764	9005310	9005856	9006402	9006948	9007494	9008039	9008585	546
796	9009131	9009676	9010222	9010767	9011313	9011858	9012403	9012948	9013493	9014038	545
797	9014583	9015128	9015673	9016218	9016762	9017307	9017851	9018396	9018940	9019485	545
798	9020029	9020573	9021117	9021661	9022205	9022749	9023293	9023837	9024381	9024924	544
799	9025468	9026011	9026555	9027098	9027641	9028185	9028728	9029271	9029814	9030357	544

TABLE of Logarithms.

N°	0	1	2	3	4	5	6	7	8	9	Diff.
800	9030900	9031443	9031985	9032528	9033071	9033613	9034156	9034698	9035241	9035783	542
801	9036325	9036867	9037409	9037951	9038493	9039035	9039577	9040119	9040661	9041202	542
802	9041744	9042285	9042827	9043368	9043909	9044450	9044992	9045533	9046074	9046615	541
803	9047155	9047696	9048237	9048778	9049318	9049859	9050399	9050940	9051480	9052020	541
804	9052560	9053101	9053641	9054181	9054721	9055260	9055800	9056340	9056880	9057419	539
805	9057959	9058498	9059038	9059577	9060116	9060655	9061195	9061734	9062273	9062812	539
806	9063350	9063889	9064428	9064967	9065505	9066044	9066582	9067121	9067659	9068197	539
807	9068735	9069273	9069812	9070350	9070887	9071425	9071963	9072501	9073038	9073576	538
808	9074114	9074651	9075188	9075726	9076263	9076800	9077337	9077874	9078411	9078948	537
809	9079485	9080022	9080559	9081095	9081632	9082169	9082705	9083241	9083778	9084314	537
810	9084850	9085386	9085922	9086458	9086994	9087530	9088066	9088602	9089137	9089673	536
811	9090209	9090744	9091279	9091815	9092350	9092885	9093420	9093955	9094490	9095025	535
812	9095560	9096095	9096630	9097165	9097699	9098234	9098768	9099303	9099837	9100371	535
813	9100905	9101440	9101974	9102508	9103042	9103576	9104109	9104643	9105177	9105710	534
814	9106244	9106778	9107311	9107844	9108378	9108911	9109444	9109977	9110510	9111043	533
815	9111576	9112109	9112642	9113174	9113707	9114240	9114772	9115305	9115837	9116369	533
816	9116902	9117434	9117966	9118498	9119030	9119562	9120094	9120626	9121157	9121689	532
817	9122221	9122752	9123284	9123815	9124346	9124878	9125409	9125940	9126471	9127002	532
818	9127533	9128064	9128595	9129126	9129656	9130187	9130717	9131248	9131778	9132309	531
819	9132839	9133369	9133899	9134430	9134960	9135490	9136019	9136549	9137079	9137609	530
820	9138139	9138668	9139198	9139727	9140257	9140786	9141315	9141844	9142373	9142903	529
821	9143432	9143961	9144489	9145018	9145547	9146076	9146604	9147133	9147661	9148190	529
822	9148718	9149246	9149775	9150303	9150831	9151359	9151887	9152415	9152943	9153471	528
823	9153998	9154526	9155054	9155581	9156109	9156636	9157163	9157691	9158218	9158745	527
824	9159272	9159799	9160326	9160853	9161380	9161907	9162433	9162960	9163487	9164013	527
825	9164539	9165066	9165592	9166118	9166645	9167171	9167697	9168223	9168749	9169275	526
826	9169800	9170326	9170852	9171378	9171903	9172429	9172954	9173479	9174005	9174530	526
827	9175055	9175580	9176105	9176630	9177155	9177680	9178205	9178730	9179254	9179779	525
828	9180303	9180828	9181352	9181877	9182401	9182925	9183449	9183973	9184497	9185021	524
829	9185545	9186069	9186593	9187117	9187640	9188164	9188687	9189211	9189734	9190258	524
830	9190781	9191304	9191827	9192350	9192873	9193396	9193919	9194442	9194965	9195488	523
831	9196010	9196533	9197055	9197578	9198100	9198623	9199145	9199667	9200189	9200711	523
832	9201233	9201755	9202277	9202799	9203321	9203842	9204364	9204886	9205407	9205929	521
833	9206450	9206971	9207493	9208014	9208535	9209056	9209577	9210098	9210619	9211140	521
834	9211661	9212181	9212702	9213222	9213743	9214263	9214784	9215304	9215824	9216345	520
835	9216865	9217385	9217905	9218425	9218945	9219465	9219984	9220504	9221024	9221543	520
836	9222063	9222582	9223102	9223621	9224140	9224659	9225179	9225698	9226217	9226736	519
837	9227255	9227773	9228292	9228811	9229330	9229848	9230367	9230885	9231404	9231902	518
838	9232440	9232958	9233477	9233995	9234513	9235031	9235549	9236066	9236584	9237102	518
839	9237620	9238137	9238655	9239172	9239690	9240207	9240724	9241242	9241759	9242276	517
840	9242793	9243310	9243827	9244344	9244860	9245377	9245894	9246410	9246927	9247444	517
841	9247960	9248476	9248993	9249509	9250025	9250541	9251057	9251573	9252089	9252605	516
842	9253121	9253637	9254152	9254668	9255184	9255699	9256215	9256730	9257245	9257761	515
843	9258276	9258791	9259306	9259821	9260336	9260851	9261366	9261880	9262395	9262910	515
844	9263424	9263939	9264453	9264968	9265482	9265997	9266511	9267025	9267559	9268053	515
845	9268567	9269081	9269595	9270109	9270622	9271136	9271650	9272163	9272677	9273190	514
846	9273704	9274217	9274730	9275243	9275757	9276270	9276783	9277296	9277808	9278321	513
847	9278834	9279347	9279859	9280372	9280885	9281397	9281909	9282422	9282934	9283446	512
848	9283959	9284471	9284983	9285495	9286007	9286518	9287030	9287542	9288054	9288565	511
849	9289077	9289588	9290100	9290611	9291123	9291634	9292145	9292656	9293167	9293678	511

TABLE of Logarithms.

N	0	1	2	3	4	5	6	7	8	9	Diff.
850	9294189	9294700	9295211	9295722	9296233	9296743	9297254	9297764	9298275	9298785	510
851	9299296	9299806	9300316	9300826	9301336	9301847	9302357	9302866	9303376	9303886	510
852	9304396	9304906	9305415	9305925	9306434	9306944	9307453	9307963	9308472	9308981	510
853	9309490	9309999	9310508	9311017	9311526	9312035	9312544	9313053	9313562	9314070	509
854	9314579	9315087	9315596	9316104	9316612	9317121	9317629	9318137	9318645	9319153	509
855	9319661	9320169	9320677	9321185	9321692	9322200	9322708	9323215	9323723	9324230	508
856	9324738	9325245	9325752	9326259	9326767	9327274	9327781	9328288	9328795	9329301	507
857	9329808	9330315	9330822	9331328	9331835	9332341	9332848	9333354	9333860	9334367	506
858	9334873	9335379	9335885	9336391	9336897	9337403	9337909	9338415	9338920	9339426	506
859	9339932	9340437	9340943	9341448	9341953	9342459	9342964	9343469	9343974	9344479	506
860	9344985	9345489	9345994	9346499	9347004	9347509	9348013	9348518	9349023	9349527	505
861	9350032	9350536	9351040	9351544	9352049	9352553	9353057	9353561	9354065	9354569	504
862	9355073	9355576	9356080	9356584	9357087	9357591	9358095	9358598	9359101	9359605	504
863	9360108	9360611	9361114	9361617	9362120	9362623	9363126	9363629	9364132	9364635	503
864	9365137	9365640	9366143	9366645	9367148	9367650	9368152	9368655	9369157	9369659	502
865	9370161	9370663	9371165	9371667	9372169	9372671	9373172	9373674	9374176	9374677	502
866	9375179	9375680	9376182	9376683	9377184	9377686	9378187	9378688	9379189	9379690	502
867	9380191	9380692	9381193	9381693	9382194	9382695	9383195	9383696	9384196	9384697	501
868	9385197	9385698	9386198	9386698	9387198	9387698	9388198	9388698	9389198	9389698	500
869	9390198	9390697	9391197	9391697	9392196	9392696	9393195	9393695	9394194	9394693	500
870	9395193	9395692	9396191	9396690	9397189	9397688	9398187	9398685	9399184	9399683	499
871	9400182	9400680	9401179	9401677	9402176	9402674	9403172	9403670	9404169	9404667	498
872	9405165	9405663	9406161	9406659	9407157	9407654	9408152	9408650	9409147	9409645	497
873	9410142	9410640	9411137	9411635	9412132	9412629	9413126	9413623	9414120	9414617	497
874	9415114	9415611	9416108	9416605	9417101	9417598	9418095	9418591	9419088	9419584	497
875	9420081	9420577	9421073	9421569	9422065	9422562	9423058	9423553	9424049	9424545	496
876	9425041	9425537	9426032	9426528	9427024	9427519	9428015	9428510	9429005	9429501	495
877	9429996	9430491	9430986	9431481	9431976	9432471	9432966	9432461	9433956	9434450	494
878	9434945	9435440	9435934	9436429	9436923	9437418	9437912	9438406	9438900	9439395	494
879	9439889	9440383	9440877	9441371	9441865	9442358	9442852	9443346	9443840	9444333	493
880	9444827	9445320	9445814	9446307	9446800	9447294	9447787	9448280	9448773	9449266	493
881	9449759	9450252	9450745	9451238	9451730	9452223	9452716	9453208	9453701	9454193	493
882	9454686	9455178	9455671	9456163	9456655	9457147	9457639	9458131	9458623	9459115	492
883	9459607	9460099	9460591	9461082	9461574	9462066	9462557	9463049	9463540	9464031	492
884	9464523	9465014	9465505	9465996	9466487	9466978	9467469	9467960	9468451	9468942	491
885	9469433	9469923	9470414	9470905	9471395	9471886	9472376	9472866	9473357	9473847	491
886	9474337	9474827	9475317	9475807	9476297	9476787	9477277	9477767	9478257	9478747	490
887	9479236	9479726	9480215	9480705	9481194	9481684	9482173	9482662	9483151	9483641	490
888	9484130	9484619	9485108	9485597	9486085	9486574	9487063	9487552	9488040	9488529	489
889	9489018	9489506	9489995	9490483	9490971	9491460	9491948	9492436	9492924	9493412	489
890	9493900	9494388	9494876	9495364	9495852	9496339	9496827	9497315	9497802	9498290	487
891	9498777	9499264	9499752	9500239	9500726	9501213	9501701	9502188	9502675	9503162	487
892	9503649	9504135	9504622	9505109	9505596	9506082	9506569	9507055	9507542	9508028	486
893	9508515	9509001	9509487	9509973	9510459	9510946	9511432	9511918	9512404	9512889	486
894	9513375	9513861	9514347	9514832	9515318	9515803	9516289	9516774	9517260	9517745	485
895	9518230	9518716	9519201	9519686	9520171	9520656	9521141	9521626	9522111	9522595	485
896	9523080	9523565	9524049	9524534	9525018	9525503	9526987	9526472	9526956	9527440	485
897	9527924	9528409	9528893	9529377	9529861	9530345	9530828	9531312	9531796	9532280	484
898	9532763	9533247	9533731	9534214	9534697	9535181	9535664	9536147	9536631	9537114	484
899	9537597	9538080	9538563	9539046	9539529	9540012	9540494	9540977	9542460	9542943	483

Table of Logarithms.

N	0	1	2	3	4	5	6	7	8	9	Diff.
900	9542425	9542908	9543390	9543873	9544355	9544837	9545319	9545802	9546284	9546766	482
901	9547248	9547730	9548212	9548694	9549176	9549657	9550139	9550621	9551102	9551584	482
902	9552065	9552547	9553028	9553510	9553991	9554472	9554953	9555434	9555916	9556397	481
903	9556878	9557358	9557839	9558320	9558801	9559282	9559762	9560243	9560723	9561204	480
904	9561684	9562165	9562645	9563125	9563606	9564086	9564566	9565046	9565526	9566006	480
905	9566486	9566966	9567445	9567925	9568405	9568885	9569364	9569844	9570323	9570803	479
906	9571282	9571761	9572241	9572720	9573199	9573678	9574157	9574636	9575115	9575594	479
907	9576073	9576552	9577030	9577509	9577988	9578466	9578945	9579423	9579902	9580380	479
908	9580858	9581337	9581815	9582293	9582771	9583249	9583727	9584205	9584683	9585161	478
909	9585639	9586117	9586594	9587072	9587549	9588027	9588505	9588982	9589459	9589937	478
910	9590414	9590891	9591368	9591845	9592322	9592800	9593276	9593753	9594230	9594707	476
911	9595184	9595660	9596137	9596614	9597090	9597567	9598043	9598520	9598996	9599472	475
912	9599948	9600425	9600901	9601377	9601853	9602329	9602805	9603281	9603756	9604232	475
913	9604708	9605183	9605659	9606135	9606610	9607086	9607561	9608036	9608512	9608987	475
914	9609462	9609937	9610412	9610887	9611362	9611837	9612312	9612787	9613262	9613736	475
915	9614211	9614686	9615160	9615635	9616109	9616583	9617058	9617532	9618006	9618481	475
916	9618955	9619429	9619903	9620377	9620851	9621325	9621799	9622272	9622746	9623220	474
917	9623693	9624167	9624640	9625114	9625587	9626061	9626534	9627007	9627481	9627954	473
918	9628427	9628900	9629373	9629846	9630319	9630792	9631264	9631737	9632210	9632683	472
919	9633155	9633628	9634100	9634573	9635045	9635517	9635990	9636462	9636934	9637406	472
920	9637878	9638350	9638822	9639294	9639766	9640238	9640710	9641181	9641653	9642125	472
921	9642596	9643068	9643539	9644011	9644482	9644953	9645425	9645896	9646367	9646838	472
922	9647309	9647780	9648251	9648722	9649193	9649664	9650135	9650605	9651076	9651546	471
923	9652017	9652488	9652958	9653428	9653899	9654369	9654839	9655309	9655780	9656250	470
924	9656720	9657190	9657660	9658130	9658599	9659069	9659539	9660009	9660478	9660948	470
925	9661417	9661887	9662356	9662826	9663295	9663764	9664233	9664703	9665172	9665641	469
926	9666110	9666579	9667048	9667517	9667985	9668454	9668923	9669392	9669860	9670329	469
927	9670797	9671266	9671734	9672203	9672671	9673139	9673607	9674076	9674544	9675012	468
928	9675480	9675948	9676416	9676884	9677351	9677819	9678287	9678754	9679222	9679690	468
929	9680157	9680625	9681092	9681559	9682027	9682494	9682961	9683428	9683895	9684362	467
930	9684829	9685296	9685763	9686230	9686697	9687164	9687630	9688097	9688564	9689030	466
931	9689497	9689963	9690430	9690896	9691362	9691829	9692295	9692761	9693227	9693693	466
932	9694159	9694625	9695091	9695557	9696023	9696488	9696954	9697420	9697885	9698351	466
933	9698816	9699282	9699747	9700213	9700678	9701143	9701608	9702074	9702539	9703004	465
934	9703469	9703934	9704399	9704863	9705328	9705793	9706258	9706722	9707187	9707652	465
935	9708116	9708581	9709045	9709509	9709974	9710438	9710902	9711366	9711830	9712294	464
936	9712758	9713222	9713686	9714150	9714614	9715078	9715542	9716005	9716469	9716932	464
937	9717396	9717859	9718323	9718786	9719249	9719713	9720176	9720639	9721102	9721565	463
938	9722028	9722491	9722954	9723417	9723880	9724343	9724805	9725268	9725731	9726193	462
939	9726656	9727118	9727581	9728043	9728506	9728968	9729430	9729892	9730354	9730816	462
940	9731279	9731741	9732202	9732664	9733126	9733588	9734050	9734511	9734973	9735435	462
941	9735896	9736358	9736819	9737281	9737742	9738203	9738664	9739126	9739587	9740048	461
942	9740509	9740970	9741431	9741892	9742353	9742814	9743274	9743735	9744196	9744656	460
943	9745117	9745577	9746038	9746498	9746959	9747419	9747879	9748340	9748800	9749260	460
944	9749720	9750180	9750640	9751100	9751560	9752020	9752479	9752939	9753399	9753858	459
945	9754318	9754778	9755237	9755697	9756156	9756615	9757075	9757534	9757993	9758452	459
946	9758911	9759370	9759829	9760288	9760747	9761206	9761665	9762124	9762582	9763041	459
947	9763500	9763958	9764417	9764875	9765334	9765792	9766251	9766709	9767167	9767625	459
948	9768083	9768541	9769000	9769458	9769915	9770373	9770831	9771289	9771747	9772204	458
949	9772662	9773120	9773577	9774035	9774492	9774950	9775407	9775864	9776322	9776779	457

Table of Logarithms.

N	0	1	2	3	4	5	6	7	8	9	Diff.
950	9777236	9777693	9778150	9778607	9779064	9779521	9779978	9780435	9780892	9781348	457
951	9781805	9782262	9782718	9783175	9783631	9784088	9784544	9785001	9785457	9785913	457
952	9786369	9786826	9787282	9787738	9788194	9788650	9789106	9789562	9790017	9790473	456
953	9790929	9791385	9791840	9792296	9792751	9793207	9793662	9794118	9794573	9795028	456
954	9795484	9795939	9796394	9796849	9797304	9797759	9798214	9798669	9799124	9799579	455
955	9800034	9800488	9800943	9801398	9801852	9802307	9802761	9803216	9803670	9804125	455
956	9804579	9805033	9805487	9805942	9806396	9806850	9807304	9807758	9808212	9808666	454
957	9809119	9809573	9810027	9810481	9810934	9811388	9811841	9812295	9812748	9813202	454
958	9813655	9814108	9814562	9815015	9815468	9815921	9816374	9816827	9817280	9817733	453
959	9818186	9818639	9819092	9819544	9819997	9820450	9820902	9821355	9821807	9822260	453
960	9822712	9823165	9823617	9824069	9824522	9824974	9825426	9825878	9826330	9826782	452
961	9827234	9827686	9828138	9828589	9829041	9829493	9829945	9830396	9830848	9831299	452
962	9831751	9832202	9832654	9833105	9833556	9834007	9834459	9834910	9835361	9835812	451
963	9836263	9836714	9837165	9837616	9838066	9838517	9838968	9839419	9839869	9840320	451
964	9840770	9841221	9841671	9842122	9842572	9843022	9843473	9843923	9844373	9844823	450
965	9845273	9845723	9846173	9846623	9847073	9847523	9847973	9848422	9848872	9849322	450
966	9849771	9850221	9850670	9851120	9851569	9852019	9852468	9852917	9853366	9853816	450
967	9854265	9854714	9855163	9855612	9856061	9856510	9856959	9857407	9857856	9858305	449
968	9858754	9859202	9859651	9860099	9860548	9860996	9861445	9861893	9862341	9862790	448
969	9863238	9863686	9864134	9864582	9865030	9865478	9865926	9866374	9866822	9867270	448
970	9867717	9868165	9868613	9869060	9869508	9869955	9870403	9870850	9871298	9871745	447
971	9872192	9872640	9873087	9873534	9873981	9874428	9874875	9875322	9875769	9876216	447
972	9876663	9877109	9877556	9878003	9878450	9878896	9879343	9879789	9880236	9880682	446
973	9881128	9881575	9882021	9882467	9882913	9883360	9883806	9884252	9884698	9885144	446
974	9885590	9886035	9886481	9886927	9887373	9887818	9888264	9888710	9889155	9889601	445
975	9890046	9890492	9890937	9891382	9891828	9892273	9892718	9893163	9893608	9894053	445
976	9894498	9894943	9895388	9895833	9896278	9896722	9897167	9897612	9898057	9898501	444
977	9898946	9899390	9899835	9900279	9900723	9901168	9901612	9902056	9902500	9902944	443
978	9903389	9903833	9904277	9904721	9905164	9905608	9906052	9906496	9906940	9907383	443
979	9907827	9908271	9908714	9909158	9909601	9910044	9910488	9910931	9911374	9911818	443
980	9912261	9912704	9913147	9913590	9914033	9914476	9914919	9915362	9915805	9916247	443
981	9916690	9917133	9917575	9918018	9918461	9918903	9919345	9919788	9920230	9920673	442
982	9921115	9921557	9921999	9922441	9922884	9923326	9923768	9924210	9924651	9925093	442
983	9925535	9925977	9926419	9926860	9927302	9927744	9928185	9928627	9929068	9929510	442
984	9929951	9930392	9930834	9931275	9931716	9932157	9932598	9933039	9933480	9933921	441
985	9934362	9934803	9935244	9935685	9936126	9936566	9937007	9937448	9937888	9938329	440
986	9938769	9939210	9939650	9940090	9940531	9940971	9941411	9941851	9942291	9942731	440
987	9943172	9943612	9944051	9944491	9944931	9945371	9945811	9946251	9946690	9947130	440
988	9947569	9948009	9948448	9948888	9949327	9949767	9950206	9950645	9951085	9951524	440
989	9951963	9952402	9952841	9953280	9953719	9954158	9954597	9955036	9955474	9955913	439
990	9956352	9956791	9957229	9957668	9958106	9958545	9958983	9959422	9959860	9960298	439
991	9960737	9961175	9961613	9962051	9962439	9962927	9963365	9963803	9964241	9964679	438
992	9965117	9965554	9965992	9966430	9966868	9967305	9967743	9968180	9968618	9969055	437
993	9969492	9969930	9970367	9970804	9971242	9971679	9972116	9972553	9972990	9973427	437
994	9973864	9974301	9974738	9975174	9975611	9976048	9976485	9976921	9977358	9977794	437
995	9978231	9978667	9979104	9979540	9979976	9980413	9980849	9981285	9981721	9982157	437
996	9982593	9983029	9983465	9983901	9984337	9984773	9985209	9985645	9986080	9986516	436
997	9986952	9987387	9987823	9988258	9988694	9989129	9989564	9990000	9990435	9990870	435
998	9991305	9991741	9992176	9992611	9993046	9993481	9993916	9994350	9994785	9995220	435
999	9995655	9996090	9996524	9996959	9997393	9997828	9998262	9998697	9999131	9999566	435

Deſcription and Uſe of the preceding Table.—In the above table are contained the logarithm of all numbers, from 1 to 10,000, which may be found by inſpection, according to the method deſcribed below; but it will be proper, before we enter upon that ſubject, to make a few remarks with regard to the index, or characteriſtic, of logarithms, which are omitted throughout, and muſt therefore be ſupplied by the operator, according as the caſe may require. It has been ſhewn that the baſe, or radix of the ſyſtem, is 10; and ſince

$$10^0 = 1,\ 10^1 = 10,\ 10^2 = 100,\ 10^3 = 1000, \ \&c.$$

therefore the log. of 1 = 0, the log. of 10 = 1, the log. of 100 = 2, the log. of 1000 = 3, &c.; and, conſequently, the logarithm of any number between 1 and 10 has its logarithm greater than 0, and leſs than 1; a number between 10 and 100 has its logarithm greater than 1, and leſs than 2; between 100 and 1000 the logarithm is greater than 2, and leſs than 3, and ſo on; therefore, the integral part of the logarithm, or its index, is always one leſs than the number of its integral places. Again, ſince

$$\frac{1}{10} = 10^{-1},\ \frac{1}{100} = 10^{-2},\ \frac{1}{1000} = 10^{-3},$$

it follows, that the logarithm of .1 = − 1, of .01 = − 2, of .001 = − 3, &c.; conſequently, the logarithm of a number between 1 and .1 has its index properly 0, and its decimal part negative; but for the greater convenience, and this is one great advantage attending Briggs's logarithms, we may aſſume the index negative, and the decimal part poſitive; that is, inſtead of ſubtracting the decimal part from unity, and making the reſult negative, we retain the decimal as it ariſes, and make the index negative: whence, the logarithm of a decimal greater than .1, has its index = − 1; if it be leſs than .1, but greater than .01, the index is − 2; if it be leſs than .01, but greater than .001, the index is − 3; and ſo on: whence it follows, that the index of the logarithm of any decimal is negative, and always one more than the number of ciphers which precede the firſt effective figure. Or both rules, *viz.* for integers and decimals, may be reduced to one, which is as follows. The index of the logarithm of any number is always equal to the number of places that the decimal point is diſtant from the unit's place, being poſitive if the decimal point be to the right of the unit's place, and negative if it be to the left of it. What has been ſaid will be illuſtrated by the following examples:

Numbers.	Logarithms.
34560.	4.5385737
3456.0	3.5385737
345.60	2.5385737
34.560	1.5385737
3.4560	0.5385737
.34560	−1.5385737
.034560	−2.5385737
.0034560	−3.5385737
.00034560	−4.5385737

Theſe examples will illuſtrate all that has been ſaid with regard to the index, and at the ſame time will ſhew the great advantage of the preſent ſyſtem of logarithms; for here the tabular part of the logarithm is the ſame throughout, whereas with any other radix, each of the numbers would have required a different logarithm; and, conſequently, much more extenſive tables than any of thoſe now in common uſe would be neceſſary under thoſe circumſtances.

To find the logarithm of any number by the table.—If the number conſiſts of leſs than three figures, annex a cipher to it, or two if neceſſary, conſidering it as a decimal, and look for the number thus increaſed in one of the firſt columns of the table, marked N, and the number in the adjacent column is the decimal part of the logarithm, to which prefix the proper index according to the above rule.

If the number conſiſts of three figures, it may be found immediately in one of the firſt columns, and its logarithm in the adjacent column, to which prefix the proper index as above.

If the number conſiſts of four figures, look for the firſt three in the column marked N, and ſeek the fourth figure in the line at the head of the page; and trace it down to the line in which the three firſt figures are found, and the meeting of the two lines will give the logarithm required; to which prefix the proper index. Thus,

The log. 34 = log. 34.0 = 1.5314789
The log. 6 = log. 6.00 = 0.7781513
log. 456 = 2.6589648
log. 4569 = 3.6590506
log. 45.69 = 1.6590506.

If the number conſiſts of more than four places, find the logarithm anſwering to the firſt four as above, and for the reſt multiply the number ſtanding in the correſponding column of difference, by the remaining figures of the propoſed number, and cut off from the right hand of the product as many figures as the multiplier conſiſts of, and add the other part of it to the right-hand figures of the logarithm before found; then prefix to that ſum the proper index, according to the rule above given. Thus, to find the logarithm of 34.6782;

$$\begin{array}{lrcr}
\text{log.} & 34.67 = 1.5391604 & \text{Diff.} = & 125 \\
 & 102 & & 82 \\
\cline{2-2}\cline{4-4}
\text{log.} & 34.6782 = 1.5391706 & & 250 \\
\cline{2-2}
 & & & 1000 \\
\cline{4-4}
 & & & 102(50 \\
\cline{4-4}
\end{array}$$

and in the ſame manner the logarithm of any number whatever may be found.

To find the number anſwering to any given logarithm by the table.—Seek for the decimal part of the logarithm in one of the columns of the table, and if it be found there *exactly*, the correſponding number is that required, the firſt three figures of which will be found in the column marked N, and the fourth in the head line of the table. Then point off the proper number of integers or decimals by the converſe of the rule given in the preceding article, *viz.* the unit's place muſt ſtand ſo many places to the right or left of the firſt figure, as is denoted by the index; to the right if that index be poſitive, and to the left if negative.

Thus, the natural number anſwering to the logarithms

2.5434472 is 349.5
−2.5434472 is 0.03495

when 9 in the firſt, and 0. in the ſecond, are made the places of units agreeably to the rule. But if the logarithm be not found exactly in the table, then ſeek the next greater and the next leſs, as alſo the difference between the leſs and the given logarithm, and between the leſs and the greater; which will be found in the correſponding column of difference; divide the former difference by the latter, and annex the quotient to the right-hand of the four figures before taken out, which will be the number required, remembering to point off the decimals according to the rule.—Note, The above quotient cannot be depended upon for more than two places.

Find the number correſponding to the logarithm
2.5430987.

Next greater log.	2.5431986	Given log.	2.5430987
Next leſs log.	2.5430742	Next leſs	2.5430742
Tabular differ.	1244	Differ.	245

1244)245.00(19
1244
12060
11196
.864

Therefore 349.219 is the number ſought, the firſt four figures being the number anſwering to the leaſt logarithm.

To perform arithmetical operation by logarithms.

Multiplication by logarithms.—Take out the logarithms of the factors from the table, and their ſum will be the logarithm of the product ſought; then, by means of the table, find the natural number anſwering to that logarithm, which will be the product required. Obſerving to add what is carried from the decimal part of the logarithm to the affirmative index, or indices, or ſubtract it from the negative. Alſo adding the indices together if they are of the ſame kind; *viz.* all poſitive, or all negative, but to ſubtract them if they be of different kinds, prefixing the ſign of the greater to the remainder. Thus,

Multiply together .7684, 68.42, and .34876
log. of .7684 = − 1.8855874
log. of 68.42 = 1.8351831
log. of .34876 = − 1.5425267
Product 18.3357 = 1.2632972

Diviſion by logarithms.—Here the logarithms are to be taken out as above, and then the logarithm of the diviſor muſt be ſubtracted from that of the dividend, and the remainder will be the logarithm of the quotient ſought, obſerving to change the ſign of the index of the diviſor from affirmative to negative, or from negative to affirmative; then take the ſum of the indices, if they be of the ſame kind, or ſubtract them if they be of different kinds, prefixing the ſign of the greater for the index. Alſo, if 1 is borrowed in the left-hand place of the decimal part of the logarithm, add it to the index of the diviſor when that index is affirmative, but ſubtract it when negative; then let the ſign be changed, and worked with as before. Thus, for example,

Divide 37.149 by 523.67
log. 37.149 = 1.5699471
log. 523.67 = 2.7190577
Quotient .0709397 = − 2.8508894

Involution, or raiſing of powers by logarithms.—Multiply the logarithm of the given number by the index of the power to which it is to be raiſed; and the product will be the logarithm of the power required. But in multiplying a logarithm with a negative index, the product will be negative, but what is carried from the decimal part will be poſitive, and muſt, therefore, in that caſe, be ſubtracted from that product.

Hence, to find the cube of .307146
log. of .307146 = − 1.4873449
3
Power .0289758 − 2.4620347

Evolution, or the extraction of roots by logarithms.—Divide the logarithm of the given number by the index of the power, the root of which is to be extracted, and the quotient will be the logarithm of the root required; obſerving, that if the index of the logarithm be negative, as many units muſt be borrowed as will make it exactly diviſible, and ſo many units muſt then be carried to the decimal part of the logarithm, and the diviſion carried on as uſual.

Required the cube root of .12345
log. 12345 3)−1.0914911
Root .497925 −1.6971637

Theſe are the moſt ſimple caſes in which logarithms are introduced into arithmetical operations; the application of them to more complex caſes, as in Trigonometry, Menſuration, &c. will be explained under the reſpective heads.

Logarithm, *Imaginary*, is uſed for the logarithm of negative and imaginary quantities, ſuch as $-a$, $\sqrt{-a}$, &c. Thus, alſo, the fluents of certain imaginary fluxionary expreſſions, ſuch as $\frac{\dot{x}}{x\sqrt{-1}}$, $\frac{a\dot{x}}{2bx\sqrt{-1}}$, &c. are imaginary logarithms. Euler Analyſ. Infin. vol. i. p. 72. 74.

The expreſſion $\frac{\dot{x}}{x}$ repreſents the fluxion of the logarithm of x, and the fluent, therefore, of $\frac{\dot{x}}{x}$ is the logarithm of x; but no logarithm can repreſent the fluent of $\frac{\dot{x}}{x\sqrt{-1}}$, which is therefore called an imaginary logarithm.

However, when theſe imaginary logarithms occur in the ſolutions of problems, they may be transformed into circular arcs or ſectors; that is, the imaginary logarithm, or imaginary hyperbolic ſector becomes a real circular ſector. See Bernouilii, Oper. tom. i. p. 400. and p. 512. Maclaurin's Fluxions, art. 762, ſeq. Walmeſly, Anal. des Meſ. p. 63.

LOGE, in *Geography*, a town of Germany, in the county of Hoya; 20 miles S.W. of Nienburg.

LOGGERHEAD Key, or *El Contoy*, a ſmall iſland in the bay of Honduras, near the coaſt of Yucatan. N. lat. 21° 25′. W. long. 87° 45′.

LOGGERHEAT, in the *Sea Language*, denotes a large round ball of iron, with a long handle for heating pitch.

LOG-HOUSES, houſes in America, which are generally the firſt that are erected on any new ſettlement, and which are cheaper than any others in a country where wood abounds. The ſides conſiſt of trees juſt ſquared, and placed horizontally one upon the other; the ends of the logs of one ſide reſting alternately on the ends of thoſe of the adjoining ſides, in notches; the interſtices between the logs are ſtopped with clay; and the roof is covered with boards or ſhingles, which are ſmall pieces of wood in the ſhape of ſlates or tiles, &c. which are uſed for that purpoſe, with few exceptions, throughout America. Theſe habitations are not very ſightly, but when well built they are warm and comfortable, and laſt for a long time. Some of them are built with brick or ſtone, or elſe conſtructed with wooden frames, ſheathed on the outſide with boards.

LOGIC, the art of thinking juſtly; or of making a right uſe of our rational faculties, in defining, dividing, and reaſoning: or, as it is defined by an excellent writer on this ſubject, logic is the art of uſing reaſon well in our enquiries after truth, and the communication of it to others. Watts.

The word is Greek, λογικη, derived from λογος, *ſermo*, *diſcourſe;* in regard thinking is only an inward, mental diſcourſe, wherein the mind converſes with itſelf.

Logic is alſo ſometimes called *dialectica;* and ſometimes the *canonical art*, as being a canon, or rule for directing us in our reaſonings.

As, in order to think aright, it is neceſſary that we apprehend, judge, diſcourſe, and diſpoſe, or methodize, rightly: hence perception or apprehenſion, judgment, diſcourſe or reaſoning, and diſpoſition, whence reſults method, become the four fundamental articles of this art; and it is from our reflections on thoſe operations of the mind that logic is, or ought to be, wholly drawn.

Lord Bacon divides logic into four branches, according to the ends propoſed in each: for a man reaſons, either to find what he ſeeks, or to judge of what he finds, or to retain what he judges, or to teach what he retains; whence ariſe ſo many arts of reaſoning; *viz.* the art of *inquiſition*, or invention; the art of *examining*, or judgment; the art of *preſerving*, or of memory; and the art of *elocution*, or delivery.

Logic, having being extremely abuſed, is now in ſome diſrepute. The ſchools have ſo clogged it with barbarous terms and phraſes, and have run it out ſo much into dry uſeleſs ſubtleties, that it ſeems rather intended to exerciſe the mind in wrangling and diſputation than to aſſiſt it in thinking juſtly. It is true, in its original, it was rather intended as the art of cavilling than of reaſoning; the Greeks, among whom it had its riſe, being a people who piqued themſelves mightily upon their being able to talk *extempore;* and to argue, by turns, on either ſide of the queſtion.—Hence their dialectici, to be always furniſhed with arms for ſuch rencontres, invented a ſet of words and terms, rather than rules and reaſons, fitted for the uſe of contention and diſpute.

Logic, then, was only an art of words, which frequently had no meaning, but ſerved well enough to hide ignorance inſtead of improving knowledge; to baffle reaſon inſtead of aſſiſting it; and to confound the truth inſtead of clearing it. Much of that heap of words, and rules, which we have borrowed from the old logic, is of little uſe in life; and is ſo far out of the common uſage, that the mind does not attend to them without trouble: and finding nothing in them to reward its attention, it ſoon diſcharges itſelf, and loſes all ideas it had conceived of them.

But logic, diſengaged from the jargon of the ſchools, and reduced into a clear and intelligible method, is the art of conducting the underſtanding in the knowledge of things, and the diſcovery of truth.

From its proper uſe we gain ſeveral very conſiderable advantages: for, 1. The conſideration of rules incites the mind to a cloſer attention and application in thinking: ſo that we hereby become aſſured, that we make the beſt uſe of our faculties. 2. We hereby more eaſily and accurately diſcover and find out the errors and defects in our reaſoning; for the common light of reaſon, unaſſiſted by logic, frequently obſerves an argumentation to be faulty, without being able to determine wherein the preciſe failure conſiſts. 3. By theſe reflections on the order and manner of the operations of the mind, we are brought to a more juſt and complete knowledge of the nature of our own underſtanding. See SOUL and UNDERSTANDING.

LOGICAL CONCRETE. See CONCRETE.

LOGICAL *Part*. See PART.

LOGINOV, in *Geography*, a town of Ruſſia, in the government of Tobolſk, on the Irtiſch; 16 miles S.E. of Tara.

LOGISTA, the title of an officer at Athens, whoſe buſineſs was to receive and paſs the accounts of magiſtrates when they came out of their office.

The logiſtæ were in number ten; they were elected by lot, and had ten euthyni, or auditors of accounts, under them.

LOGISTIC, or LOGARITHMIC *Line*, a curve ſo called, from its properties and uſes, in conſtructing and explaining the nature of logarithms.

If the right line AX (*Plate* XI. *Analyſis*, *fig.* 4.) be divided into any number of equal parts, and to the points of thoſe diviſions, A, P, p, &c. be drawn lines continually proportional, the points N, M, m, &c. form the logiſtic or logarithmic line or curve.

Here the abſciſſas AP, Ap, &c. are the logarithms of the ſemiordinates PM, pm, &c.

Hence, if $AP = x$, $Ap = v$, $PM = y$, $pm = z$, and the logarithms of y and $z = ly$ and lz; x will be $= ly$, and $v = lz$; conſequently $x : v = ly : lz$; that is, the denominators of the ratios $AN : PM$, and $AN : pm$, are to one another as the abſciſſas AP and Ap.

Hence it follows, that there may be infinite other logiſtic lines invented: provided $xm : vm :: ly : lz$, that any of the roots, or powers, may be the logarithms of the ſemiordinates. The logiſtic will never concur with the axis, except at an infinite diſtance; ſo that AX is its aſymptote. See LOGARITHMIC *Curve*.

LOGISTIC, *Quadrature of the*. See QUADRATURE.

LOGISTIC, or *Logarithmic ſpiral*, a line whoſe conſtruction is as follows: Divide the quadrant of a circle into any number of equal parts, in the points N, n, n, &c. (*Plate* XI. *Analyſis*, *fig.* 5.) and from the radii CN, Cn, Cn, &c. cut off CM, Cm, Cm, &c. continually proportional, the points M, m, m, &c. form the logiſtic ſpiral.

The arcs, therefore, AN, An, &c. are the logarithms of the ordinates CM, Cm, &c. whence alſo it follows, that there may be infinite logiſtic ſpirals. See SPIRAL.

LOGISTICA, or LOGISTICAL *Arithmetic*, a denomination ſometimes given to the arithmetic of ſexageſimal fractions, uſed by aſtronomers in their calculations.

It was ſo called from a Greek Treatiſe of one Barlaamus Monachus, who wrote about ſexageſimal multiplication very accurately; and intitled his book Λογιστικη. This author Voſſius places about the year 1350, but he miſtakes the work for a treatiſe of Algebra.

Shakerly, in his Tabulæ Britannicæ, has a table of logarithms adapted to the ſexageſimal fractions; which, therefore, he calls logiſtical logarithms; and the expeditious arithmetic of them, which is by this means obtained, and by which all the trouble of multiplication and diviſion is ſaved, he calls logiſtical arithmetic.

LOGOGRAPHI, Λογογραφοι, among the *Ancients*, were the ſecretaries of the logiſtæ, and kept an account of the public revenues.

LOGOGRAPHY, derived from λογος, *word*, and γραφω, *I write*, a new mode of printing, in which the types correſpond to whole words, and not, according to the uſual method, to ſingle letters. For this mode of printing a patent was obtained ſome years ago, and in the year 1785 the origin and utility of the art were ſtated in a treatiſe written by Henry Johnſon. From the year 1778 he made ſeveral ſucceſsful attempts for the practice of this art. The author has undertaken to demonſtrate ſeveral advantages belonging to this method of printing; *viz.* 1. That the compoſitor ſhall have leſs charged upon his memory than in the common way. 2. That it is much leſs liable to error. 3. That the type of each word is as eaſily laid hold of as that of a ſingle letter. 4. That the decompoſition is much more readily performed, even by novices, than that of mere letters. 5. That no extraordinary expence nor greater number of types is required in the logographic than in the common method of printing. For other particulars, we muſt refer to the author's own account of the invention. See STEREOGRAPHY.

LOGOGRIPHUS, from the Greek λογος, *diſcourſe*, and γριφος, or γριπος, *net*, a kind of ſymbol, or riddle, propoſed to ſtudents for their ſolution, in order to exerciſe and improve the mind.

The logogriphus uſually conſiſts in ſome equivocal alluſion, or mutilation of words; which, literally taken, ſignify ſomething different from the thing intended by it; ſo that it is a kind of medium between a rebus and proper enigma.

According to Kircher, logogriphi are a kind of canting arms: thus a perſon called Leonard, who bore in his arms a lion and nard, or ſpikenard, according to that father, made a logogriphe. Œdip. Ægypt.

In another place, the ſame author defines logogriphus to be an enigma; which, under one name or word, will bear various meanings, by adding or retrenching ſome part of it. This kind of enigmas is well known to the Arabs; among whom are authors who treat expreſsly of it.

LOGONE, in *Geography*, a town of Hindooſtan, in Viſiapour; 10 miles N. of Poonah.

LOGONI, a town of Sardinia; nine miles E. of Cagliari.

LOGORAS, a town of Syria; 15 miles N. of Antioch.

LOGOS, λογος, Gr. מימרא, Chald. (*memra*), or *word*, Eng. in *Philoſophy* and *Theology*, a term very differently underſtood and applied by both ancient and modern writers. Thoſe who believe that the logos was the perſonification of the divine intellect, or of the divine attributes of wiſdom, power, &c. trace this doctrine to the ancient Platoniſts, from whom, as they conceive, it was adopted by the Chriſtian fathers. It muſt be acknowledged, however, that Plato expreſſes himſelf with a conſiderable degree of obſcurity on this ſubject. Whilſt he aſcribes the origin of the univerſe to the Supreme God, whom he denominates αγαθος, or the good, without the inſtrumentality of any ſubordinate being whatever, and who is repreſented as having formed it according to a pattern previouſly formed in his own mind; he ſometimes leads us to conceive that he regarded this pattern or idea of the divine mind as a *ſecond principle* of things, and the world itſelf, which was produced from thoſe ideas, as a *third principle*. But it does not ſatisfactorily appear that he made the divine mind, *i. e.* νους (*nous*) or λογος (*logos*) a diſtinct intelligent being. His Demiurgus, or immediate maker of the world, ſeems to have been the Supreme Being himſelf, and not any ſubordinate agent or principle whatever. The reaſon, or logos, which, according to him, comes from God, and by which he made the univerſe, ſeems, in his view of it, to have been ſynonimous with διανοια and επιστημη, of his underſtanding, and not any other proper perſon or agent. In the writings of Plato, logos has only two acceptations, *viz.* thoſe of *ſpeech*, and of *reaſon*, ſuch as is found in man. But when this philoſopher ſpeaks of νους, or λογος, as ſomething diſtinct from the Divine Being himſelf, as a power or property belonging to him, and all divine power and properties being *ſubſtance*, it would be very natural and eaſy to transform this divine power into a ſubſtantial perſon; and this we ſhall find to have been the caſe with reſpect to the later Platoniſts, agreeably to one of the Platonic maxims, *viz.* that *being* and *energy* are the ſame thing. Philo, a learned Jew of Alexandria, and contemporary with the apoſtles, approached more nearly to a real perſonification of the logos than Plato himſelf, or his immediate followers. Although he did not proceed ſo far as ſome of the Platonizing Chriſtians, and make a permanent intelligent perſon of the divine logos, he made of it an occaſional one, repreſenting it as the viſible medium of all the communications of God to man, and of the inſtrument by which he both made the world and maintained an intercourſe with the patriarchs of the Old Teſtament. Philo dignifies this logos with the appellation of God; but in order to diſtinguiſh him from the Supreme God, he ſays, that the latter is known by the term God with the article prefixed to it, *the God;* whereas the logos, like other inferior gods, is only called *God*, without the article. Whilſt he aſcribes proper *creation* to God the father only, he attributes the *forming* of created matter to the logos. The Jews did not, in general, uſe the term logos, or מימרא (*memra*) which correſponds to it in the Platonic ſenſe, but as ſynonimous to God, or the mere token, or ſymbol, of the divine preſence. Inſtances occur in various paſſages of the Old Teſtament, and a ſimilar phraſeology may be found in the "Wiſdom of Solomon," which ſome have aſcribed to Philo. The Chriſtian Platoniſts, deriving their notions from the ſchool of Alexandria, and the reſemblance diſcernible in ſome of the doctrines of Plato to thoſe of the ſacred ſcriptures, could not help thinking, that he had actually borrowed them from the writings of Moſes, with which, as they thought, he might have been acquainted during his reſidence in Egypt, or on his travels in the Eaſt. This opinion is frequently expreſſed and inculcated by Juſtin Martyr, and others of the fathers. A modern writer (ſee Prieſtley's Early Opinions) affirms, that Juſtin was the firſt, or one of the firſt, who advanced the doctrine of the permanent perſonality of the logos; of whom he ſays, "Jeſus Chriſt is the only proper ſon of God, being his logos, firſt born and powerful." Many of the Chriſtian fathers, however, maintained that the logos was an *attribute* of the Father, and that this attribute became the perſon of the Son, and was afterwards united to Jeſus Chriſt. But we ſhould enlarge this article far beyond its proper limits, if we cited more authorities in relation to this ſubject. We muſt therefore content ourſelves with preſenting to our readers a brief account of the ſentiments of modern divines with regard to the logos. It has been very generally allowed that this name belongs, in a peculiar and appropriate ſenſe, to Jeſus Chriſt; of whoſe nature and rank of being different notions have been entertained. (See ARIANS, SABELLIANS, SOCINIANS, TRINITARIANS, and UNITARIANS. See alſo PRE-EXISTENCE *of Chriſt* and TRINITY.) We ſhall here ſubjoin a brief abſtract of theſe opinions from ſome of the principal writers on this ſubject. The Pſeudo-Athanaſians, as they are denominated by the author of "The Apology of Ben Mordecai &c." ſeem to maintain, that the logos, or word of God, and that God, with whom he was in the beginning, and whoſe ſon he is, and the Holy Spirit, who proceeds from them both, are each of them, *ſingly*, the one Supreme God; and yet the three all *together* are the ſame Supreme God. To this purpoſe Dr. Clarke, in his "Scripture Doctrine of the Trinity," mentions the interpretation which ſome have given of the phraſe, "the word was God" (John i. 1.) The *logos*, or *word*, is conceived by ſuch perſons to be another ſelf-exiſtent, underived, independent perſon, co-ordinate in eſſential ſupreme authority and dominion with the Father Almighty: and this, ſays Dr. Clarke, whatever metaphyſical union may be imagined of two ſuch co-ordinate perſons, will always and neceſſarily, in the religious and moral ſenſe, be real polytheiſm; ſubverting that firſt and great foundation of all religion, both natural and revealed, the monarchical unity of the great King and God of the univerſe; and directly contrary to that firſt and great commandment in both Teſtaments (Deut. vi. 4. and Mark xii. 29.) "Hear, O Iſrael, the Lord our God is one Lord, &c."

Another opinion with reſpect to the logos, is that which ſuppoſes the appellation to deſignate a pre-exiſtent ſpirit, of inconceivably exalted rank, and poſſeſſing ſupereminent power and perfection, which derives being from an immediate act of the power and will of God, in contradiſtinction to exiſtence by mere neceſſity of nature, and called only begotten becauſe it is thus derived from the Father in a ſingular and inconceivable manner, and ſo as to be thus diſtinguiſhed from all other beings. This pre-exiſtent ſpirit, or logos, according to the doctrine of Apollinarius about the year 370, and the Arians, deſcended from heaven, and ſupplied the place of a ſoul in Chriſt. To this purpoſe Mr. Whiſton ſays, "the ſcripture, and earlieſt antiquity, never affirm, that Chriſt took a human rational ſoul; they never ſay, he took a whole human nature; they never ſay, that he was in that ſenſe a true and perfect man; but that he was made fleſh; had a body prepared for him; was the Word, or a God incarnate; was made in the likeneſs of man; was found in faſhion as a man, while he was God the word. Nay, Ignatius directly affirms, that it was the Word, and not a human ſoul, which inhabited in that body; and almoſt all the ancients agree in the ſame doctrine; even Athanaſius himſelf, before the council of Nice." It is ſaid by Ben Mordecai, that notwithſtanding the pains that were taken to diſcourage this opinion, it appeared again, in different ſhapes, in the Chriſtian church in the doctrine of the Monothelites; who held, that Chriſt had only one will, which, without doubt, is ſufficient for one perſon. Agreeably to this ſame uſe of the appellation logos, Dr. Clarke interprets the ſeveral paſſages that pertain to it in the 1ſt chapter of the goſpel of St. John. In this ſenſe "the word was with God;" not εν τω θεω, in God, as reaſon or underſtanding is *in* the mind, but προς τον θεον, with God, as one perſon is preſent with another; and "the word was God;" not θεος εστι, is God, but θεος ην, was God, or that viſible perſon, who under the Old Teſtament appeared from the beginning εν μορφη θεου, the viſible image of the inviſible God, in whom the name of God was, the angel of the Lord, &c. Phil. ii. 6. Col. i. 15. Exod. xxiii. 21. Zech. xii. 8. &c. &c. If this be the right interpretation of the text, then the words, εν αρχη ην ο λογος, in the beginning was the word, and ο λογος σαρξ εγενετο, the word was made fleſh, mean, that the ſame perſon who in the fulneſs of the time was made man and dwelt with us, did before dwell with God, and acted in the capacity of a divine perſon, as the viſible image of the inviſible God, by whom God made all things, and by whom all things were from the beginning tranſacted between God and the creature; and as he is ſtyled (1 Cor. i. 24.) the Power of God, and the Wiſdom of God, upon account of the wiſdom and power of God being manifeſted in and by him; ſo here he is ſtyled (ο λογος) the Word, becauſe he does λεγειν; he does, as Revealer, Lawgiver, and Judge, declare the will, the laws, the ſentence of his Father. Thoſe who adopt this opinion alſo maintain, that Chriſt was the perſon, by whom God created and governs the world, and that in and by him the Deity appeared to men under the Old Teſtament by the name of Jehovah, the Angel of the covenant, and ſimilar appellations. The apoſtle tells us (Heb. i. 2. xi. 3.) that it was by Chriſt God made the world, αἰῶνας, the ages or diſpenſations; *i. e.* by whom, ſays Ben Mordecai, God formerly diſpoſed and ordered thoſe eminent and remarkable periods of time: the Antediluvian, the Patriarchal, the Moſaic, and the Preſent, being put under his government, according to the will of the Father. Now the ages or diſpenſations before Chriſt, we know from our own ſcriptures, were ordered by the angel Jehovah; and if he were not the Chriſt, the Old and New Teſtament contradict one another; by aſcribing the ſame government to two different beings. St. Paul therefore could mean no other perſon by Chriſt, than the ſame logos or word of God; whom Philo, and all of that age, underſtood to be the angel of the covenant, or the angel Jehovah. The ſame truth is confirmed by many other references in the goſpels and epiſtles; in which the ſenſe is defective, upon any other principle.

There is another opinion concerning the logos, which has had many advocates among modern divines, and eſpecially among thoſe who are denominated Unitarians. Perſons of this deſcription underſtand by the logos, either not a real perſon, or God himſelf. Accordingly ſome of them interpret the paſſage above cited in the following manner: "In the beginning was Reaſon, and Reaſon was with God, and Reaſon was God." But the ſenſe of theſe propoſitions amounts to nothing more, as Dr. Clarke has ſtated it, than that God always was a rational being; or if we underſtand by logos, the wiſdom, or power, or any of the attributes of God, the concluſion will be much the ſame. This, we muſt allow, is in itſelf a certain truth; and, as to the manner of the expreſſion, it might perhaps in ſome ſenſe, by a figurative way of ſpeaking, be affirmed, that the reaſon of God, or any one of his attributes, is God; yet this is nothing to the purpoſe of (what St. John is here treating of) the incarnation of Chriſt. For the reaſon of God is no otherwiſe God, than the reaſon of a man is the man himſelf. According to this interpretation, therefore, all thoſe declarations of ſcripture, in which it is affirmed that "the word was made fleſh and dwelt among us (John i. 14.), that Chriſt "came forth from the Father (John xvi. 28.), that "he came down from heaven (John iii. 13.), that "he came down from heaven, not to do his own will, but the will of him that ſent him (John vi. 18.), that he "took part of fleſh and blood (Heb. ii. 14.), that, having been "in the form of God," he did (κενωσαι εαυτον) *empty himſelf* of that form, "and was made in the likeneſs of man," and "found in faſhion as a man," (Phil. ii. 6, 7, 8.) :—All theſe expreſſions (according to this laſt interpretation of the words, θεος ην ο λογος), will in reality mean nothing more than that "the wiſdom of the Father dwelt in the "Man Chriſt Jeſus;" that is, that Chriſt was only in a more perfect and continued manner than other prophets, "an inſpired *man*." Nothing, ſays Dr. Clarke, can be more forced and unnatural than this interpretation. It is reducing the whole doctrine of the humiliation and incarnation of the ſon of God to a mere figure of ſpeech; and under the appearance of ſpeaking of Chriſt as the Supreme God, making him really nothing but a mere man. This, however, would ſerve the purpoſe of thoſe who are advocates for the ſimple humanity of Chriſt.

Dr. Lardner, in his "Letter on the Logos, written in the year 1730," profeſſes, that he was once favourable to the ſuppoſition, that the logos was the ſoul of our Saviour; but being at a loſs to conceive how that high being, the firſt and only immediately derived being by whom God made the world, ſhould gain any exaltation by receiving after his reſurrection and aſcenſion, a bright reſplendent human body, and being made the king and lord of all good men in this world, and the judge of mankind, and being made higher than the angels, to whom he was vaſtly ſuperior before, abandoned this hypotheſis, as throughout inconceivable, and irreconcileable to reaſon. Having ſtated ſome difficulties, which have been ſince repeatedly urged by Unitarians, and which thoſe who are advocates for the pre-exiſtent dignity of Chriſt are far from thinking to be incapable of a ſatiſfactory ſolution, and having given interpretations of the paſſages that ſeem to intimate and to expreſs the doctrine of our Saviour's pre-exiſtence, he proceeds to explain the introduction to St. John's goſpel. "In the beginning was the Word." By beginning he underſtands not the beginning of the goſpel, as others of ſimilar ſentiments have underſtood it, but of the creation, or rather always from eternity "was the Word." "And the word was with God;" that is, always with God, though not fully manifeſted, till theſe laſt days of the world. "And the word was God," ſometimes rendered, though not correctly, "And God was the word." Notwithſtanding the ſeeming tautology, he is of opinion, that God here is the ſame God that was mentioned before; and that St. John intends the one true God, not any inferior deity.

Theſe paſſages ſtill remain unſatiſfactorily interpreted, whatever be the hypotheſis concerning the logos that is admitted; but this is not the place to purſue more at large the diſcuſſion of this point. Our theological readers will be led by this article to ſeek further information from thoſe commentators and critics, who have expreſsly written on this ſubject.

LOGOTHETA, an officer under the emperors of the Eaſt, who kept an account of the various branches of public and private expence.

There were ſeveral kinds of them diſtinguiſhed by the particular branch they ſuperintended, as the *logotheta* τȣ δρομȣ, or *poſt-maſter general*; *logotheta* των οικειακων, or *maſter of the houſhold*, &c.

LOGRONO, in *Geography*, a town of Spain, in Old Caſtile, on the Ebro; containing a court of inquiſition, five pariſhes, eight convents, and about 5000 inhabitants. The environs produce fruit, legume, flax, hemp, excellent wine, oil, and ſilk: 20 miles N.W. of Calahorra. N. lat. 42° 23′. W. long. 3° 24′.—Alſo, a town of South America, in the province of Quito; 40 miles E.S.E. of Cuenza.

LOGSTOR, or Lixtoer, a town of Denmark, in North Jutland, on Lymford gulf; 21 miles W. of Aalborg. N. lat. 57°. E. long. 9° 15′.

LOGSTOWN, a town of America, on the W. ſide of the Ohio; 18 miles from Pittſburg.

LOGUR, a town of Hindooſtan; 20 miles W.N.W. of Poonah.

LOGWOOD, in *Botany*, the wood of a tree; for the botanical characters of which, ſee Hæmatoxylum. The wood of this tree is brought in logs of about three feet in length, to Europe, where it is uſed for dyeing purples, and for the fineſt blacks; and therefore it is a very valuable commodity.

The uſe of logwood in dyeing was eſtabliſhed in this country by 13 & 14 Car. II. cap. 11. before which time it was prohibited as a pernicious material. A conſiderable part of the ſoluble portion of the wood is taken up both by water and alcohol, but much more by the latter, and theſe menſtrua become tinged by it of a deep purple-red or brown. If acids be added to the watery decoction, it is turned yellow, but alkalies give a very deep purple colour, without yielding any precipitate. Alum, added to the decoction of logwood, cauſes a violet precipitate or lake, and the ſupernatant liquor alſo remains violet, and gives a freſh portion of lake on the effuſion of an alkali. The ſalts of iron give an inky black with all the ſolutions of logwood, under the ſame circumſtances as with galls, whence the preſence of gallic acid in logwood is evinced. The ſolutions of tin form a very fine violet-coloured lake with the decoction of logwood, and wholly precipitate the colouring matter, ſo that the ſupernatant liquor is quite clear and colourleſs. In dyeing, logwood gives its own natural purple, with ſhades or variations according to the mordant uſed, or it heightens and improves the common black with iron and galls. In this latter way it gives a peculiar gloſs and luſtre, on which account it is a very valuable dyeing material.

Logwood is uſed in miniature painting to make a purple waſh; which may be varied to a more red or blue colour by the addition or omiſſion of Brazil wood. The waſh may be prepared by boiling an ounce of ground logwood in a pint of water, till one-half of the fluid be waſted; ſtrain it then through flannel, while of a boiling heat; and add to it, when ſtrained, about ten grains of pearl-aſhes. To make it more red, add half an ounce of Brazil wood, or in proportion as the colour wanted may require; uſing in this caſe the pearl-aſhes very ſparingly. This wood has a ſweetiſh ſubaſtringent taſte, but a remarkable ſmell. It gives a purpliſh-red tincture to watery and ſpirituous infuſions, and tinges the ſtools, and ſometimes the urine, of the ſame colour; but it does not appear to colour the bones of animals.

Beſides its uſe among dyers, it is employed medicinally as an aſtringent and corroborant. In diarrhœas it has been found peculiarly efficacious; alſo in the latter ſtages of dyſentery, when the obſtructing cauſes are removed, it ſerves to obviate that extreme laxity of the inteſtines uſually ſuperinduced by repeated dejections. Extractum ligni campechenſis is ordered in the pharmacopeias, and may be given in the doſe of one ſcruple or two, repeated according to the urgency of the ſymptoms. The extract is obtained by inſpiſſating the decoctions. To promote the extraction, the wood ſhould be reduced into a fine powder, which is to be boiled in the water, in the proportion of a pound to a gallon, till half the liquor is waſted. Some digeſt the powdered wood in as much ſpirit as will cover it to the height of about four inches, and afterwards boil it in water; the matters taken up by the watery and ſpirituous menſtrua may be united into one extract, by inſpiſſating the watery decoction to the conſiſtence of honey, and then gradually ſtirring in the ſpirituous tincture.

Logwood *Country*, in *Geography*, a diſtrict of America, that lies N.W. of the Moſquito ſhore, at the head of the bay of Honduras, and extends from Vera Paz to Yucatan, from 15° to 18° N. lat. The whole coaſt is overſpread with iſlets, keys, and ſhoals, and the navigation is intricate.

Logwood *Lagoon*, a bay or gulf on the N.E. coaſt of Yucatan. N. lat. 20° 57′. W. long. 88° 20′.

Logwood *Mill*, in the *Manufactures*, is a machine for reducing logwood, or other dyeing woods, to ſmall chips or raſpings, that the colouring matter may be more readily extracted from them by the dyer. Theſe machines are of two kinds: one, by means of knives fixed to a large wheel, chips the wood acroſs the grain into ſmall fragments, which are afterwards reduced to a fine powder, by grinding them beneath a pair of rolling ſtones: this is called a chipping engine. The other kind operates by ſteel bars, with a great number of notches in the edge, which raſps and cuts the end of the wood into powder; this is called the raſping engine. Both machines require an immenſe power to actuate them, and are generally worked by water-wheels or by ſteam-engines. A plan and elevation of a raſping engine is given in *Plate* XXXI. *Mechanics*, *figs.* 1 and 2, where A is an iron cog-wheel, turned round by the large cog-wheel of a water-mill or ſteam-engine; its axis has an iron cylinder B fixed upon it, and this has a number of ſteel bars or knives *a* fixed in its circumference. The pieces of wood to be raſped are placed in a ſtrong wooden trough, D D, in which an iron bar, E, ſlides, and forces the wood down to the cylinder, being moved by two racks, F, F, turned by pinions on an axis, G. At one end of this is a handle, *g*, and at the other a wheel, *h*, which is turned by a pinion, *k*, at the extremity of a long ſpindle, H I, which is turned by a wheel, K, whoſe teeth are engaged by threads of a worm or endleſs ſcrew, *l*, cut on the end of the main axis. By this means the pinions are conſtantly turning round with a very ſlow motion, and advance the wood towards the cylinder, which is at the ſame time in motion, and its raſps cut the wood into powder. A ſection of the raſp cylinder is ſhewn in *fig.* 3, where the ſame letters are uſed. In this *m* is the groove in which tenants at the ends of the bar, E, ſlide. This bar has many large ſpikes in it, which faſten into the wood. At *n* is a ſtrong iron plate at the end of the trough, to defend it from wearing away by the great preſſure of the wood down upon it. The wood is kept down in the trough by the croſs-bar, L, *fig.* 2, fixed down over them. The iron cylinder, B, is caſt with 24 grooves in it lengthways, and in theſe are laid as many ſteel bars, Y, Z, *fig.* 3, the ſection of which is X. The angle, *r*, being ground to a ſharp edge, and the ſide, *r s*, cut with teeth, as ſeen at Z, ſo that the edge is ſerrated, as ſhewn by Y; the knives are held in their grooves by a ſtrong hoop, *n*, *fig.* 2, driven on the ends of the cylinder over the knives, and they are wedged in faſt by ſmall iron wedges. When the wood in the engine is all raſped, and it needs a freſh ſupply, the pinion, *k*, is diſengaged from the wheel *h*, and then the winch, *g*, being turned by a man, the racks are withdrawn. To diſengage the pinion, *k*, its bearing is fixed in a beam, O, which ſwings on a hinge at the upper end, and the lower end has a rod, *p*, jointed to it, which is engaged by a catch, *r*, when the handle, *t*, at the extremity of the rod, is moved away from the cylinder, ſo as to engage the pinion, *k*, with its wheel, *h*. But on moving the end of the rod towards the cylinder, it is relieved from the catch, and the pinion is diſengaged from the wheel; and to prevent the bar, E, going ſo far as to endanger its teeth meeting the raſps, a pin is fixed into a particular part of one of the racks, *f*, which takes hold of the rod, *p*, when it has got as far as intended, and removes the rod from the catch, *r*, and then the racks do not advance any farther to the raſps. The wheel at R S, joining in the axes H and I, is called a friction box: it conſiſts of an iron box, R, fixed on the end of the axis, I; its cavity receives a conical plug, S, fitted upon the end of the other axis, H, and preſſed into the box by a lever, T, loaded with a weight. By this means, if the wood does not raſp away ſo faſt as the motion of the racks would advance it, the cone, S, ſlips round in the box, R, and allows for the difference of the movements, which would otherwiſe break the machine. The cylinders of raſping engines generally turn round from 15 to 20 times per minute, and will reduce a great quantity of wood to a powder in a ſhort time. *Figs.* 4 and 5 are two elevations of a *chipping engine:* here A is part of a ſtrong iron axis, turned with a conſiderable velocity by water or ſteam: upon the end is a ſmall circular flanch, B, to which is bolted a circular iron-plate, D, in which four knives are fixed, ſo that their edges project a very ſmall quantity before the ſurface of the wheel in the manner of a plane iron. E is an iron frame containing the bearing for the pivot of the wheel; it has a ſmall trough, F, caſt all in one piece with it. All this iron work is ſcrewed down to the wood framing, G G. The wood, H, is in this machine preſented to the knives in the wheel by a man who holds it in the trough, and advances it as the knives cut away the end. Theſe chips are cut acroſs the grain but obliquely, as is evident from *fig.* 4: they are afterwards ground to a fine powder by a rolling ſtone, or runner upon edge. A large and heavy fly-wheel is uſually fixed on the axis, A, of the chipping wheel to regulate its movement. A method of reducing logwood has been lately introduced by ſawing it with a circular ſaw (ſee SAW), which cuts off a flake from the end of a piece of wood *x*, ſo that the jar of the ſaw ſhatters the flake all into powder. By this means, at every cut the ſaw cuts away as much wood as its thickneſs in ſaw duſt and the flake, which is as much more, is reduced at the ſame time, ſo that all the wood is reduced, though only one-half is cut, whereas, in the raſping engine, every particle muſt be cut by the machine. This improvement merits the attention of the woollen manufacturers, whoſe numerous logwood mills would be much improved by the adoption of this method.

LOHA, a town of Algiers; 28 miles E. of El Callah.

LOHARCANA, a town of Nepaul; 10 miles S. of Batgao.

LOHARINAPAUL, a town of Nepaul; 15 miles S. of Catmandu.

LOHAROO, a town of Hindooſtan, in Dooab; 10 miles N.W. of Pattiary.

LOHE, a town of Auſtria; 12 miles W.S.W. of Crems.

LOHEIA, a town of Arabia, in the province of Yemen, on the coaſt of the Red ſea, founded, about three centuries ago, by a Mahometan ſaint, who built a hut on the ſhore where the town now ſtands, and ſpent the reſt of his days there as a hermit. After his death, a "Kabbat," or houſe of prayer, was erected over his tomb, and it was afterwards gradually embelliſhed and endowed. Some devout perſons reſorted hither, and built huts for themſelves about his tomb. The harbour of Macabra, a neighbouring town, being about this time filled up, the inhabitants who deſerted it ſettled at Loheia, and transferred the ſeat of government to this place. The territory of Loheia is arid and barren; and the harbour is indifferent, ſo that at ebb-tide, laden boats cannot approach near it; but, notwithſtanding this diſadvantage, a conſiderable trade in coffee, brought from the neighbouring hills, is carried on in this town. The coffee is not ſo good as that which is procured by way of Mocha and Hodeida from Beit el Fakih, but it is purchaſed on more reaſonable terms, and the carriage to Jidda is leſs expenſive. On this account ſeveral merchants from Cairo reſide at Loheia, and others annually reſort hither for the purchaſe of coffee. In this town are alſo 40 poor Banians, who are employed in different trades. Loheia has no walls, but is defended by 12 towers garriſoned by ſoldiers, and placed at equal diſtances round it. The height of their gates render it neceſſary to aſcend them by means of ladders. It is but one of theſe towers that admits of being defended by cannons. Thus expoſed to the depredations of the Arabs, the inhabitants have been ſometimes reduced to the neceſſity of leaving the town, and of taking refuge in a ſmall iſland, whither they carry with them their moſt valuable effects. Several of the houſes in Loheia are built of ſtone; but they are generally huts, conſtructed after the Arabian faſhion; the walls conſiſting of mud mixed with dung, and the roof thatched with a ſort of graſs which is common here. Around theſe walls is a range of beds made of ſtraw, affording convenience for ſitting or lying. Theſe houſes are not large enough to admit of being divided into ſeparate apartments; they have ſeldom any windows, and the door is only a ſtraw-mat. When an Arab has a family and cattle, he builds for their accommodation ſeveral ſuch huts, and incloſes the whole with a ſtrong wooden fence. Lime is prepared in the neighbourhood of the town, by the calcination of coral from the ſea in the open air, and without a furnace. The water at Loheia is very bad, and therefore they are ſupplied from the diſtance of 2½ leagues, which is brought to them in earthen jars upon camels or aſſes. Within two leagues of the town is a ſmall hill which affords conſiderable quantities of mineral ſalt. The inhabitants are curious, intelligent, and poliſhed in their manners. The women wear large veils in the ſtreets, and yet they have no objection to throw them aſide before ſtrangers. One of theſe females, who preſented herſelf to view, had her brow, cheeks, and chin, ornamented with black ſpots, impreſſed into the ſkin, and her eyes were alſo artificially blackened. In this town they have all the inſtruments neceſſary for diſtilling brandy; they have alſo a ſort of wine, prepared from an infuſion of dry grapes in water, in a pot which is buried in the ground in order to make the liquor ferment. They have alſo a thick, white liquor, called "Buſa," prepared from meal mixed with water, and brought into a ſtate of fermentation. Niebuhr.

LOHMEN, a town of Saxony, in the margravate of Meiſſen; 10 miles E.S.E. of Dreſden.

LOHNIN, a town of Brandenburg; 10 miles S.E. of Brandenburg.

LOHOCK. See Loch.

LOHORPOUR, in *Geography*, a town of Hindooſtan, in Oude; 20 miles S. of Mahomdy.

LOHR, a town of Germany, in the county of Rieneck, on the Maine; 21 miles N.W. of Wurzburg.

Lohr *Hampton*, a town of Germany, in the county of Hanau-Munzenburg; 22 miles E. of Hanau.

LOHRY, a town of Hindooſtan, in Behker, on the Sinde; 15 miles S. of Behker.

LOHTO, a town of Sweden, in the government of Waſa; 18 miles N.E. of Gamla Karleby.

LOHURDEGA, a town of Bengal, in the circar of Nagpour; 22 miles N.N.W. of Doeſa. N. lat. 23° 20′. E. long. 84° 51′.

LOHURSEY, a town of Bengal, at which is a paſs acroſs the mountains; 18 miles N.N.E. of Pelamow.

LOIBERSTORFF, a town of Auſtria; 14 miles S. of Vienna.—Alſo, a town of Auſtria; 10 miles S.W. of St. Polten.

LOIHL, a range of mountains between Carinthia and Carniola.

LOIMAJOKI, a town of Sweden, in the government of Abo; 32 miles N.N.E. of Abo.

LOINS, in *Anatomy*, the lower and poſterior part of the trunk of the body, or the ſpace ſituated between the upper edge of the pelvis, and the laſt ribs. The inferior end of the vertebral column occupies the middle of this region; it is called the lumbar portion of the ſpine, and the vertebræ compoſing it are the lumbar vertebræ. (See Spine.) The loweſt of theſe reſts on the upper ſurface of the ſacrum, and thus joins the cheſt to the pelvis. This part of the ſpine is the centre of the reciprocal motions of the cheſt and pelvis; it is covered on each ſide, towards the back, by a thick maſs of muſcle, forming two convex prominences, with a hollow between them, correſponding to the ſpinous proceſſes. Theſe muſcles are the great powers concerned in extending the ſpine, and maintaining it erect. (See Dorsi *longiſſimus*, and Sacrolumbalis.) They are affected in ſtrains of the trunk, and in lumbago, in which caſes all motions of the loins are performed with great difficulty and pain. The ſides of the lumbar region of the ſpine are covered by the pſoæ muſcles, which belong to the hip-joint. The collections of matter forming ſerous abſceſſes are found in the cellular ſubſtance about theſe muſcles. Cloſe to the ſide of the ſpine, the interval between the criſta of the os innominatum and the laſt rib is occupied by the quadratus lumborum muſcle. (See Lumborum.) In front of this muſcle, and of the pſoas, the kidney lies, ſurrounded by looſe cellular ſubſtance, which ſeparates it from the peritoneum. (See Kidney.) The loins in front form a part of the poſterior ſurface of the abdomen; and this is called the lumbar region.

LOJO, in *Geography*, a town of Sweden, in the province of Nyland; 30 miles W. of Helſingfors.

LOJOBI, a town of Servia; 16 miles S.S.E. of Paſſarovitz.

LOIR and Cher, one of the nine departments of the central region of France, ſo called from the names of the rivers which traverſe it, the former in the ſouthern part, the other in the north, and compoſed of Bleſois and Sologne, diſtricts of Orleanais, is ſituated in 47° 40′ N. lat., S.E. of Sarthe, and bounded on the N. by the department of the Eure and Loire, on the N.E. by the Loiret, on the E. and S.E. by the Cher, on the S. by the Indre, and on the W. by the Indre and Loire, and Sarthe. It is 34 French leagues in length, and 23 broad, and contains 6717½ kiliometres, or about 339 ſquare leagues, and 211,152 inhabitants. It is divided into three diſtricts or circles, 24 cantons, and 309 communes; the circles are Vendome, containing 68,330, Blois, including 103,268, and Romorantin, comprehending 39,554 inhabitants. Its contributions amount to 2,432,733 francs, and its expences to 210,286 fr. and 19 cents. Its capital is Blois. The ſoil of this department is partly ſandy and partly fertile; yielding grain, wine, fruits, and paſtures. It abounds in lakes, marſhes, and heaths, with conſiderable foreſts, iron-mines, &c.

Loire, one of the 11 departments of the eaſtern region of France, formerly Forez, ſituated in 45° 30′ N. lat., weſt of the Rhone, 24 French leagues long and 12 broad, contains 5135 kiliometres, or 259 ſquare leagues, and 292,588 inhabitants. It is divided into three circles, 48 cantons, and 327 communes. The circles are Roanne, containing 95,668, Montbriſon, 97,659, and St. Etienne, 99,261 inhabitants. The contributions amount to 2,745,417 fr. and its expences to 244,800 fr. and 66 cents. Its capital is Montbriſon. This department is diverſified with plains, hills, and mountains. Both banks of the river Loire, from which it derives its appellation, are level, yielding grain, hemp, and paſtures. The gentle eminences near Roanne are covered with vines. Mont-Pilat, a ridge of high mountains, is ſituated at the S.E. extremity of the department, near the confines of Ardêche. Here are foreſts and mines of iron, lead, and coal.

Loire, *Upper*, one of the 12 departments of the ſouth-eaſt region of France, compoſed of Vevay and Cevennes, ſituated in 45° N. lat., ſouth of Loire and Puy de Dôme, 26 Fr. leagues long and 17 broad, contains 5282½ kiliometres, or 264 ſquare leagues, and 237,901 inhabitants. It is divided into three circles, 28 cantons, and 272 communes. The circles are Brioude, containing 70,596, Le Puy 103,068, and Yſſengeaux, 64,237 inhabitants. The capital is Le Puy. The contributions amount to 1,509,642 fr. and the expences to 219,838 fr. 23 cents. This territory, though mountainous and covered with ſnow ſix months in the year, yields grain, fruits, &c. ſufficient for the inhabitants, with good paſtures, mines of antimony, &c.

Loire, *Lower*, one of the nine departments of the weſtern region of France, formerly Upper Bretagne, a maritime territory on either hand of the Loire, is ſituated in 47° 15′ N. lat., is 30 Fr. leagues long and 27 broad, and contains 7660 kiliometres, or 382 ſquare leagues, and 368,506 inhabitants. It is divided into five circles, 45 cantons, and 209 communes. The circles are Savenay, comprehending 91,132, Chateau-Briant, 50,244, Ancenis, 36,949, Nantes, 157,940, and Paimboeuf, 32,241 inhabitants. Its capital is Nantes. Its contributions amount to 2,900,662 fr. and its expences to 345,171 fr. This department produces wheat, rye, flax, wine, and excellent paſtures, with mines of iron, coal, quarries of marble, &c. Savenay yields cyder and wine of an inferior quality. The ſecond circle is almoſt one continued foreſt. Nantes is agreeably diverſified and fertile. From the marſhes of Paimboeuf much ſalt is extracted.

LOIRET, one of the nine departments of the central region of France, a portion of Orleanais, E. of Loir and Cher, is ſituated in 47° 50′ N. lat., is 30 Fr. leagues long, and 24 broad; and contains 7047½ kiliometres, or 356 ſquare leagues, and 289,728 inhabitants. It is divided into four circles, 31 cantons, and 363 communes. The circles are Pithiviers, containing 55,061, Montargis, 61,912, Gien, 37,395, and Orleans, 135,360 inhabitants. Its capital is Orleans. Its contributions amount to 3,778,705 fr. and its expences to 337,821 fr. 52 cents. The ſoil of the ſecond circle is ſandy, yielding little grain. The products of the other diſtricts are grain, wine, hemp, ſaffron, fruits, and paſtures.

LOIRON, a town of France, in the department of the Mayenne, and chief place of a canton, in the diſtrict of Laval; ſix miles W. of Laval. The place contains 1559, and the canton 13,810 inhabitants, on a territory of 280 kiliometres, in 15 communes.

LOITSCH, or Logatez, a town of Upper Carniola; 15 miles W. of Laybach.

LOITZ, a town of Anterior Pomerania; 24 miles S. of Stralſund. N. lat. 53° 56′. E. long. 13° 5′.

LOKACZ, a town of Poland, in Volhynia; 30 miles W.S.W. of Lucko.

LOKALAX, a town of Sweden, in the government of Abo; 27 miles N.W. of Abo.

LOKE, in *Mythology*, the name of one of the deities of the northern nations, anſwering to the Arimanes among the Perſians, whom they repreſent as at enmity both with gods and men, and the author of all the evils which deſolate the univerſe. Loke is deſcribed in the Edda as producing the great ſerpent which incircles the world; which ſeems to have been intended as an emblem of corruption or ſin: he alſo gives birth to Hela or death, the queen of the infernal regions; and alſo to the wolf Fenris, that monſter who is to encounter the gods and deſtroy the world. North. Ant. vol. ii. p. 85, &c.

Loke, in *Rural Economy*, a provincial word uſed in Norfolk for a cloſe narrow lane.

LOKMAN, in *Biography*, ſurnamed *Al-Hakim*, or the *Wiſe*, a philoſopher in conſiderable eſtimation among the eaſtern nations, to whom is attributed a collection of maxims and fables, which are calculated to diſplay the moral doctrines of the ancient Arabians. There have been many hypotheſes concerning the country in which he lived, and the period at which he flouriſhed, but the greater part of the Muſſulman doctors make him contemporary with David and Solomon. It has been ſuppoſed that he was a native of Ethiopia or Nubia, and in rather a ſervile condition; that he had been a ſlave in different countries, and that he was at length ſold among the Iſraelites. His wiſdom has been aſcribed to divine inſpiration, which he received in the following manner; while aſleep at noon-day, angels came to the place where he was repoſing, ſaluted him, without rendering themſelves viſible, and declaring that God would make him a monarch and his lieutenant on earth. He ſignified his ſubmiſſion to the will of his maker, but would rather have preferred to remain in a low condition. On account of this anſwer, God beſtowed upon him wiſdom in ſo eminent a degree that he was enabled to inſtruct mankind by a great variety of maxims, ſentences, and parables, amounting to ten thouſand in number. The anecdotes which are recorded concerning the life of Lokman are found ſcattered in the writings of ſeveral of the orientals; of theſe we ſhall notice only a few. As he was once ſeated in the midſt of a circle of auditors, a man of high rank aſked if he was not that black ſlave whom he had before ſeen attending upon the flocks in the field; he replied, he was; how then, ſaid the other, have you attained to ſuch wiſdom and ſo high a reputation; "By following exactly," ſaid Lokman, "theſe three precepts; always to ſpeak the truth; to keep inviolably the promiſes made; and never to meddle with what does not concern me." It was Lokman who ſaid that "the tongue and the heart, were both the beſt and the worſt parts of men." Mahomet frequently refers to the authority of Lokman in ſupport of his own opinions and doctrines, and he is ſtill regarded by the followers of the Mahometan religion as a ſaint and a prophet. They repreſent him to have been as virtuous and pious as he was wiſe, and on that account was peculiarly bleſſed of God. Some writers aſſert that he embraced the Jewiſh religion, and entered into the ſervice of king David, who entertained a high eſteem for him, and that he died at a very advanced age. The ſcanty relics of the fables of Lokman were publiſhed by Erpenius, in Arabic and Latin, and Tannaquil Faber gave an edition of them in elegant Latin verſe. Gen. Biog.

Lokman, in *Geography*, a town of the Arabian Irak, on the Tigris; 16 miles N. of Bagdad.

LOKO, a ſmall iſland on the E. ſide of the gulf of Bothnia. N. lat. 60° 51′. E. long. 20° 59′.

LOKOHAR, a town of Hindooſtan, in Bahar; 36 miles N.E. of Durbunga.

LOKTEVA, a town of Ruſſia, in the government of Kolivan; 36 miles S.W. of Kuznetzk.

LOLBAZAR, a town of Bengal; 37 miles S.W. of Beyhar.

LOLBINIERE, a town of Canada, on the river St. Lawrence; 25 miles S.W. of Quebec.

LOLDONG, a town and fortreſs of Almora; 85 miles N.N.E. of Delhi. N. lat. 29 47′. E. long. 78° 36′.

LOLGUNGE, a town of Hindooſtan, in Oude; 16 miles N. of Manickpour.—Alſo, a town of Hindooſtan, in Benares; 22 miles S.W. of Mitzapour.—Alſo, a town of Hindooſtan, in Oude; 20 miles S. of Azemgur.

LOLICHMIUM, in *Greek Muſic*, according to Pauſanias, was the name given to the gymnaſium at Olympia, which was always open for thoſe who wiſhed to contend in literature, poetry, or muſic; and Ælian tells us, that in the 91ſt olympiad, Euripides and Xenocles diſputed the prize in dramatic poeſy at the Olympic games; at which time they were accompanied by inſtruments.

LOLIUM, in *Agriculture*, the name of a kind of graſſes, of which there are ſeveral ſpecies, ſome of which are highly uſeful to the farmer, as the lolium perenne.

Lolium, in *Botany*, a Latin word of unknown origin.—Darnel, or Darnel-graſs. Virgil calls it "*infelix lolium*," not only as being a weed amongſt corn, but probably alluding to an idea, long prevalent, that corn was transformed into it. This opinion of the change of one kind of gramineous plant into another, as wheat into rye, rye into barley, barley into darnel, darnel into brome-graſs; and of the latter by becoming oats or rye, in a fertile ſoil, returning again to a more improved ſtate; all this, however abſurd, was ſo generally believed, that Linnæus thought proper to write a diſſertation againſt it. See *Tranſmutatio Frumentorum*, Amoen. Acad. v. 5. 106—Linn. Gen. 38. Schreb. 53. Willd. Sp. Pl. v. 1. 461. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 148. Ait. Hort. Kew. ed. 2. v. 1. 174. Juſſ. 31. Lamarck Illuſtr. t. 48.—Claſs and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Gen. Ch. *Cal.* Common receptacle elongated into a ſpike, the flowers, which are diſpoſed in two ranks, being preſſed cloſe to an angle of the ſtalk. Glume of one valve, awl-ſhaped, permanent, fixed, oppoſite to the ſtalk. *Cor.* of two valves; the lowermoſt lanceolate, narrow, convoluted, pointed, the length of the calyx; the uppermoſt ſhorter, linear, blunter, concave above. Nectary of two ſmall, ovate, obtuſe leaflets, gibbous at their baſe. *Stam.* Filaments three, capillary, ſhorter than the corolla; anthers oblong. *Piſt.* Germen turbinate; ſtyles two, capillary, reflexed; ſtigmas feathery. *Peric.* none; the corolla embracing the ſeed, and finally opening to let it fall. *Seed* one, oblong, convex beneath, with a broad ſhallow furrow above, compreſſed.

Obſ. The ſeſſile ſpikelets ſtand in the ſame plane with the ſtalk, ſo that the latter ſupplies the place of an inner valve to the calyx, which nevertheleſs is ſometimes preſent, though diminutive.

Eſſ. Ch. Calyx of one valve, fixed, many-flowered. Florets two-ranked.

1. L. *perenne.* Perennial Darnel; Red Darnel; or Ray-graſs. Linn. Sp. Pl. 122. Engl. Bot. t. 315. Mart. Ruſt. t. 4. Knapp. t. 100.—Spike awnleſs. Spikelets longer than the calyx. Florets lanceolate.—A common European graſs, in rather fertile ground, about the borders of fields, road ſides, paſtures, &c. flowering in June.—The *root* is fibrous, downy, perennial. *Stem* a foot high, erect or aſcending, bent at the bottom, jointed, leafy, round in the upper part, ſtriated, ſmooth. *Leaves* linear, keeled, ſmooth, dark green, with ſmooth, ſtriated ſheaths, and a ſhort obtuſe ſtipula. *Spike* nearly erect, very flat, often a little twiſted.

A variety with a compound ſpike is figured by Leers, t. 12. f. 1; and another with a remarkably ſhort broad and denſe ſpike, in Scheuchz. Prodr. t. 2. Vaillant's t. 17. f. 3, with long awns, cited by Willdenow after Reichard, ſurely cannot belong to this ſpecies.

β. L. tenue; Linn. Sp. Pl. 122. Willd. n. 2, appears to be only a ſtarved variety of *perenne*, with very few florets in each calyx.

2. L. *temulentum.* Bearded Darnel. Linn. Sp. Pl. 122. Fl. Dan. t. 160. Leers. 48. t. 12. f. 2. Engl. Bot. t. 1124. Knapp. t. 104. Hoſt. Gram. Auſtr. v. 1. t. 26. Schreb. Gram. t. 36.—Spike awned. Spikelets ſhorter than the calyx. Florets elliptical. Stem rough in the upper part.—Native of European corn-fields, among barley, wheat, or flax, flowering in July.—*Root* annual, of a few downy fibres. *Stem* nearly ſolitary, twice as tall and ſtout as the former, erect, firm, of about three knots; very ſmooth and ſhining in the lower part; rough above. *Leaves* lanceolate, ſpreading, ribbed, rough, of a lighter green than in *perenne*. *Sheaths* roughiſh. *Stipula* very ſhort, crenate. *Spike* erect, larger and more turgid than in the former. *Calyx* without awns; in the lower ſpikelets often furniſhed with a minute, elliptical, inner valve. *Florets* numerous, ovate, ſwelling, ſlightly ribbed, rough, each tipped with an awl-ſhaped, whitiſh, rough, erect awn, twice its own length, from a little below the top.—The ſeeds are ſaid to be intoxicating to men, beaſts and birds, and even to bring on convulſions and death. We know of no miſchiefs from it in this country, where it is far from common.

3. L. *arvenſe.* Annual Beardleſs Darnel. Withering 168. Engl. Bot. t. 1125. Knapp. t. 102. (L. temulentum; Hudſ. 55.)—Spike almoſt beardleſs. Spikelets about the length of the calyx. Florets elliptical. Stem very ſmooth.—Native of fields in England and Scotland, as well as other parts of Europe. Willdenow indicates it as a variety of the laſt. It differs however, not only in being not at all, or very ſhortly, awned, but in the total ſmoothneſs of its *ſtem* and *ſpike*. The *leaves* are occaſionally rough, but on their upper ſide only. Dr. Withering, who firſt defined this ſpecies, ſays the *calyx* has two valves; but we uſually find only one. The *awns* are too large in the plate of *Engliſh Botany*.

4. L. *maximum.* Great Weſt-Indian Darnel. Willd. n. 4.—"Calyx as long as the many-flowered compreſſed ſpikelet; of which the upper florets are awned."—Native of Jamaica. *Root* annual. Whole graſs twice as large as *L. temulentum*, from which alſo it differs in having the *calyx* equal in length to the *ſpikelet*; and while the upper *florets* have long awns, the reſt are beardleſs. Yet Willdenow, from whoſe work we adopt this ſpecies, ſuſpects it may be but a variety of the ſecond.

5. L. *diſtachyon.* Double-ſpiked Indian Darnel.—Linn. Mant. 187.—Spikes in pairs. Calyx ſingle-flowered. Corolla fringed.—Sent by Koenig from the coaſt of Malabar.—*Stems* partly decumbent, ſlender, branched, ſmooth. *Leaves* ſhort, narrow, with long, ſmooth, rather tumid ſheaths. *Spikes* in pairs, terminal, equal, ſlender, two or three inches long. *Flowers* in two ranks, but directed to one ſide. *Calyx* of one valve, ſingle-flowered. *Corolla* ovate, denſely fringed with fine, long, white hairs. A ſingular graſs, whoſe genus is at leaſt doubtful. In ſome points it reſembles a *Panicum*.

Lolium *Perenne*, the botanical name of the graſs uſually known to the farmers by the name of ray-graſs: it has a perennial fibrous creeping root. The ſtems, ſeveral from the ſame root, proſtrate or oblique at the baſe, but the flowering ſtem upright, ſmooth, from ſix inches to eighteen, twenty and twenty-four inches in height, according to the ſoil: they have ſeveral joints near the baſe, at a ſmall diſtance from each other, but on the upper part only one or two. On a great number of plants of a middling ſize three joints, and never more than four, were counted by Miller, the flowering-ſtem running up from eleven to fourteen inches above the laſt joint. They are frequently ruſſet-coloured at the joints; the leaves are four or five inches long, and from two to four lines wide, lengthened out into a point; the leaf on the ſtem above twice as broad as thoſe next the root and on the runners. The ſheath covers the ſtem for ſeveral inches above the upper joint; both that and the leaves are ſmooth. The flowers are in a ſpike, which is from four to ſix or ſeven, and even nine inches in length, compoſed of many (ten to eighteen) ſpikelets, ranged at a little diſtance from each other, in two rows alternately along the rachis or common receptacle. The ſpike is generally flat, but ſometimes nearly cylindrical; and it ſometimes ſhews a diſpoſition to become branched, particularly towards the bottom. The rachis is flexuous, or changes its direction in a curve line from one ſpikelet to another; and each ſpikelet being lodged at the baſe in a hollow of it, has no occaſion for an inner valve to the calyx for protection, and therefore is not provided with one. The number of flowers in each ſpikelet varies from three or four to ſix, ſeven or eight, and even ſometimes nine, ten, or eleven; but ſix or ſeven is the moſt common number. The valve of the calyx tapers to a point; and the terminating calyx is two-leaved. The two inner huſks, which are the valves of the corolla, are both of the ſame length, or nearly ſo. The germ is placed between the upper of theſe, and two ſmall white ſemitranſparent ſubſtances, which Linnæus terms the nectaries: the ſeed eaſily quits the chaff or covering.

This is a graſs which is called in Engliſh a *ray-graſs*, from the French *ivarie*, which is their name for another ſpecies, this being termed *Fauſſe ivarie*. It is corruptly termed by farmers rie, or rye-graſs, but it bears no reſemblance to rie, or rye, that being a name appropriated to a very different graſs (Hordeum pratenſe). It has, likewiſe, by Ray been diſtinguiſhed by the title of *Red Darnel-graſs*; and in ſome places it is called *Crap*; in Devonſhire, *Eaver*; in Norfolk, *White Noneſuch*.

There are ſeveral varieties of this graſs which differ chiefly in the ſize or colour of the ſtem and ſpike, as well as the number of flowers in each ſpikelet. Alſo the flowers are now and then found with awns or beards; and the ſpikelets are alſo ſometimes cluſtered, and ſometimes branched, or divided.

It is a ſort of graſs that has been long in cultivation as an early paſture and hay graſs. See ARTIFICIAL *Graſs*, and RAY-GRASS.

LOLLARDS, in *Eccleſiaſtical Hiſtory*, a religious ſect, differing in many religious points from the church of Rome, which aroſe in Germany about the beginning of the fourteenth century; ſo called, as many writers have erroneouſly imagined, from Walter Lollard, who began to dogmatize in 1315, and was burnt at Cologn: but it is evident that Lollard was no ſurname, but merely a term of reproach applied to all heretics who concealed the poiſon of error under the appearance of piety.

The monk of Canterbury derives the origin of the word Lollard, among us, from *lolium, a tare*; as if the Lollards were the tares ſown in Chriſt's vineyard. Abelly ſays, that the word Lollard ſignifies *praiſing God*, from the German *loben, to praiſe*, and *herr, Lord*; becauſe the Lollards employed themſelves in travelling about from place to place, ſinging pſalms and hymns.

Others, much to the ſame purpoſe, derive *lollhard, lullhard*, or *lollert, lullert*, as it was written by the ancient Germans, from the old German word *lullen, lollen*, or *lallen*, and the termination *hard*, with which many of the High Dutch words end. *Lollen* ſignifies to ſing with a low voice, and, therefore, *lollhard* is a ſinger, or one who frequently ſings; and in the vulgar tongue of the Germans, it denotes a perſon who is continually praiſing God with a ſong, or ſinging hymns to his honour. The Alexians or Cellites were called Lollards, becauſe they were public ſingers who made it their buſineſs to inter the bodies of thoſe who died of the plague, and ſang a dirge over them in a mournful and indiſtinct tone as they carried them to the grave. The name was afterwards aſſumed by perſons that diſhonoured it; for we find, among thoſe Lollards who made extraordinary pretences to piety and religion, and ſpent the greateſt part of their time in meditation, prayer, and ſuch acts of piety, there were many abominable hypocrites, who entertained the moſt ridiculous opinions and concealed the moſt enormous vices under the ſpecious mark of this extraordinary profeſſion. And many injurious aſperſions were propagated againſt thoſe who aſſumed this name, by the prieſts and monks; ſo that by degrees, any perſon who covered hereſies or crimes under the appearance of piety, was called a Lollard. Thus the name was not uſed to denote any one particular ſect, but was formerly common to all perſons and all ſects, who were ſuppoſed to be guilty of impiety towards God or the church, under an external profeſſion of extraordinary piety. However, many ſocieties, conſiſting both of men and women, under the name of Lollards, were formed in moſt parts of Germany and Flanders, and were ſupported partly by their manual labours, and partly by the charitable donations of pious perſons. The magiſtrates and inhabitants of the towns, where theſe brethren and ſiſters reſided, gave them particular marks of favour and protection, on account of their great uſefulneſs to the ſick and needy. They were thus ſupported againſt their malignant rivals, and obtained many papal conſtitutions, by which their inſtitute was confirmed, their perſons exempted from the cognizance of the inquiſitors, and ſubjected entirely to the juriſdiction of the biſhops; but as theſe meaſures were inſufficient to ſecure them from moleſtation, Charles, duke of Burgundy, in the year 1472, obtained a ſolemn bull from pope Sixtus IV. ordering that the Cellites, or Lollards, ſhould be ranked among the religious orders, and delivered from the juriſdiction of the biſhops; and pope Julius II. granted them yet greater privileges in the year 1506. Moſheim informs us that many ſocieties of this kind are ſtill ſubſiſting at Cologn, and in the cities of Flanders, though they have evidently departed from their ancient rules. Eccl. Hiſt. vol. iii. 8vo.

Lollard and his followers rejected the ſacrifice of the maſs, extreme unction, and penances for ſin; arguing, that Chriſt's ſufferings were ſufficient. He is likewiſe ſaid to have ſet aſide baptiſm as a thing of no effect; and repentance, as not abſolutely neceſſary, &c. In England, the followers of Wickliffe were called, by way of reproach, Lollards, from ſome affinity there was between ſome of their tenets; though others are of opinion, that the Engliſh Lollards came from Germany.

They were ſolemnly condemned by the archbiſhop of Canterbury and the council of Oxford.

LOLLGUNGE, in *Geography*, a town of Bengal; 20 miles E.N.E. of Purneah.

LOLLI, in *Biography*, a performer on the violin of great celebrity, who came into England at the beginning of 1785; but by a caprice in his conduct equal to his performance, he was ſeldom heard. And then ſo eccentric was his ſtyle of compoſition and execution, that he was regarded as a madman by moſt of his hearers. And yet we are convinced, that in his lucid intervals he was, in a ſerious ſtyle, a very great, expreſſive, and admirable performer. In his freaks nothing can be imagined ſo wild, difficult, groteſque, and even ridiculous as his compoſitions and performance. After playing at the oratorio, and making the grave and ignorant laugh at very ſerious difficulties upon which he had, perhaps, but ill beſtowed his time, he ſuddenly left the kingdom, *à la ſourdine*; perhaps, at laſt, to ſhun difficulties of another kind.

LOLLIEI, in *Geography*, a town of Thibet; 110 miles N. of Goreah. N. lat. 30° 15′. E. long. 84° 28′.

LOLLONADO, a town of the iſland of Cuba; 146 miles S.W. of Havanna.

LO-LOS, the name of a particular people diſperſed through the province of Yun-nan, in China, diſtinct from the Chineſe. They were formerly governed by their own ſovereigns, but upon ſubmitting to the emperor of China they obtained peculiar privileges. Theſe people are well made, and inured to labour. They have a peculiar language of their own, and a mode of writing which ſeems to be the ſame with that of the bonzes of Pegu and Ava. Theſe cunning prieſts have acquired an influence over the Lo-los in the weſtern part of Yun-nan, and have introduced among them the worſhip and religious ceremonies of their country; and they have even induced them to build large temples of a different architecture from that of the Chineſe. The princes of the Lo-los are abſolute maſters of their ſubjects, and have a right of puniſhing them, even by death, without waiting for the anſwer of the viceroy. Theſe princes have many officers and men under their command; and their militia is compoſed of cavalry and infantry, who are armed with bows and lances, and ſometimes muſkets. The iron and copper mines which are lodged in their mountains, enable them to make their own armour. Theſe mountains alſo abound with mines of gold and ſilver. The dreſs of the Lo-los conſiſts of plain drawers; a veſt of cotton hanging to their knees, and a ſtraw hat; their legs are bare, and they wear only ſandals. The women have a long robe, covering the whole body down to the feet, above which they tie a ſmall cloak that reaches no further than the girdle. In this dreſs they appear on horſeback, at marriage ceremonies, or when they pay viſits, accompanied by the females in their train, who are alſo on horſeback, and by ſeveral domeſtics. Groſier.

LOLPOUR, a town of Hindooſtan, in the circar of Jyenagur; 15 miles S.S.E. of Jyepour.

LOM, a town on the E. coaſt of the iſland of Gilolo. S. lat. 0° 16′. E. long. 128°.

LOMABLEM, or LOMBLEM, an iſland in the Eaſt Indian ſea, about 120 miles in circumference. S. lat. 8° 18′. E. long. 123° 56′.

LOMATIA, in *Botany*, from λωμα, *a border*, becauſe the ſeeds are terminated by a bordered ring. Brown Tr. of Linn. Soc. v. 10. 199. Prodr. Nov. Holl. v. 1. 389. Ait. Hort. Kew. ed. 2. v. 1. 212.—Claſs and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceæ*, Juſſ. Brown.

Gen. Ch. *Cal.* none. *Cor.* Petals four, irregular, diſtinct, oblong, obliquely twiſted toward one ſide; their ſummits dilated, concave, bearing the ſtamens. Nectary three glands at one ſide of the baſe of the ſtalk ſupporting the germen. *Stam.* Filaments four, extremely ſhort, in the hollows of the petals; anthers roundiſh, ſunk in the ſaid hollows. *Piſt.* Germen ſuperior, ſtalked, half-ovate, erect; ſtyle permanent, incurved; ſtigma oblique, dilated, roundiſh, nearly flat. *Peric.* Follicle ſtalked, half-ovate, coriaceous, crowned with the ſtyle of one cell. *Seeds* many, imbricated in two rows, elliptical, compreſſed, with a terminal bordered wing, whoſe diſk is without veins.

Eſſ. Ch. Petals four, irregular. Stamens ſunk in the cavities of the limb. Three glands, on one ſide, at the baſe of the ſtalk of the germen. Stigma oblique, flattiſh. Follicle coriaceous, of one cell. Seeds many, with a terminal bordered wing.

Eight ſpecies of this genus, ſome found in New Holland, others in South America, are defined by Mr. Brown. They are "ſhrubs, with alternate leaves, which are in many caſes divided or toothed, rarely entire, ſometimes various on the ſame individual plant. Cluſters terminal, ſometimes axillary, elongated, looſe, occaſionally ſhort and corymboſe; their partial ſtalks in pairs, with one common bractea to each pair. Flowers yellowiſh-white. Involucrum none. Nucleus of the ſeed beſprinkled with ſulphur-coloured powder." *Brown.*

1. L. *ſilaifolia.* Cut-leaved Lomatia. Sims in Curt. Mag. t. 1272. (Embothrium ſilaifolium; Sm. Bot. of New Holl. 23. t. 8. E. herbaceum; Cavan. Ic. v. 4. 58. t. 384.) —Leaves doubly pinnatifid, very ſmooth; ſegments linear-wedge-ſhaped, or lanceolate, acute, pointed, reticulated with veins. Cluſters very ſmooth, elongated, ſimple or divided. —Native of light ſandy fields and heaths, on the eaſt coaſt of New Holland, near Port Jackſon. It is ſaid to have been ſent to Kew garden, by ſir Joſeph Banks, in 1792. We firſt ſaw it in flower at Meſſrs. Grimwood's, Kenſington, in the ſummer of 1793, where it was kept in the ſtove; but the ſhelter of a greenhouſe is ſufficient. It is propagated either by ſeeeds or layers. The whole *plant* is very rigid and ſmooth, three or four feet high, but little branched. *Leaves* dark green, with various, more or leſs compound, decurrent ſegments, much reſembling ſome of the umbelliferous tribe. *Flowers* white, inodorous, in long, terminal cluſters, whoſe ſtalks have occaſionally a reddiſh tinge. *Fruit* about an inch long. Every part turns quite black in drying. See EMBOTHRIUM.

2. L. *tinctoria.* Colouring Lomatia. Labill. Nov. Holl. v. 1. 31. t. 42, 43.—Leaves once or twice pinnatifid, or undivided, ſmooth; ſegments pectinate, ſingle-ribbed, almoſt veinleſs, bluntiſh, pointed. Cluſters elongated, ſmooth, unbranched.—Gathered by Labillardiere and Brown in hilly places and fields at Van Diemen's land. The *ſtem* is ſix feet high. *Leaves* very various, uſually very neatly pinnatifid, with numerous, parallel, linear-lanceolate, ſometimes ſubdivided, ſegments; more rarely undivided, ſlightly notched at the tip. *Cluſters* looſe, with fewer flowers, on longer ſtalks than the former. The ſulphur-coloured powder which covers the *ſeeds*, is ſaid by Labillardiere to give out a roſe-coloured dye to water.

3. L. *ferruginea.* Ruſty Lomatia. (Embothrium ferrugineum; Cavan. Ic. v. 4. 59. t. 385.)—Leaves doubly pinnatifid, downy; ſegments ovate or lanceolate. Cluſters ſhorter than the leaves.—Gathered by Louis Née at St. Carlos de Chiloe, South America, in places occaſionally overflowed by the ſea, flowering in February. The *ſtem* is ten or twelve feet high, rarely ſtraight; its branches downy. *Leaves* doubly pinnatifid, acute; the down of the young ones ruſty, of the old ones grey. *Petals* red within; yellowiſh-green without.

4. L. *polymorpha.* Various-leaved Lomatia.—Leaves linear-lanceolate; entire, toothed, or pinnatifid; downy, like the branches and flower-ſtalks, beneath. Cluſters corymboſe, terminal. Corolla ſomewhat hairy. Piſtil very ſmooth.—Gathered on the ſouthern hills of Van Diemen's land, by Mr. Brown, who conceives this ſpecies to have been confounded by Labillardiere under our ſecond, when he ſays "the leaves of that are ſometimes beſprinkled at their back with ſhort rufous down." Two varieties of L. *polymorpha* are indicated; one whoſe leaves are undivided, their downineſs grey, and their ſeed-veſſels but half an inch long; the other with generally cut or pinnatifid leaves, ruſty underneath, and their ſeed-veſſels near an inch in length.

5. L. *ilicifolia.* Ilex-leaved Lomatia.—"Leaves oblong-ovate, acute, with fine ſpinous teeth, reticulated, quite ſmooth, as well as their footſtalks. Cluſters elongated, terminal."—Native of barren fields at the ſides of hills on the ſouthern coaſt of New Holland, near port Phillip, where Mr. Brown gathered it, after the flowers were fallen.

6. L. *longifolia.* Long-leaved Lomatia. (Embothrium myricoides; Gærtn. v. 3. 215. t. 218? *Br.*)—Leaves li-

near-lanceolate, elongated, ſmooth, diſtantly ſerrated. Cluſters axillary. Flower-ſtalks and corolla rather hairy. Piſtil very ſmooth.—Gathered by Mr. David Burton, as well as Mr. Brown, on the ſtony banks of rivers and rivulets near Port Jackſon. This is a branched buſhy *ſhrub*, with angular young *branches*, clothed with ruſty hairs, as are alſo the *flower-ſtalks*, *bracteas*, and in ſome degree the *flowers*. The *leaves* are numerous, alternate, on ſhort broadiſh ſtalks, lanceolate, acute, veiny, three or four inches long, about half an inch broad, ſmooth except the lower portion of their rib at the upper ſide; ſharply and diſtantly ſerrated upwards, tapering and moſtly entire in their lower half. *Cluſters* axillary, ſolitary, ſimple or branched, about as long as the leaves. *Stigma* very broad, with a ſmall point. *Follicle* ſmooth, above an inch long, ſemiovate.

7. L. *dentata*. Toothed Lomatia. (Embothrium dentatum; Fl. Peruv. et Chil. v. 1. 62. t. 94, a. *Br.*)—Leaves oval, with tooth-like ſerratures, ſmooth, as well as their footſtalks. Cluſters lateral, ſhort. Corolla hairy. Germen downy.—Native of woods and groves in Chili.

8. L. *obliqua*. Oblique Lomatia. (Embothrium obliquum; Fl. Peruv. et Chil. v. 63. t. 97. E. hirſutum; Lamarck Dict. v. 2. 355.)—Leaves ovate, ſerrated, ſmooth. Cluſters axillary. Flower-ſtalks and corolla hairy. Stigma deciduous.—Found on hills in the provinces of the Conception of Chili and Puchacay.

Mr. Brown mentions that the wings of the ſeed in theſe two laſt ſpecies, which have not been ſeen by him, require examination.

LOMAZY, in *Geography*, a town of Lithuania, in the palatinate of Brzeſc; 36 miles S.S.W. of Brzeſc.

LOMAZZO, Giovanni Paolo, in *Biography*, an hiſtorical painter, born at Milan in 1538, and pupil of Gio. Battiſta Cerva. Before he became blind, which happened about the 33d year of his age, he painted much, with more whim than originality. He afterwards wrote ſeveral treatiſes on painting, in which, with the moſt tedious prolixity, he interweaves anecdote and uſeful precept, with chemic and aſtrologic nonſenſe. Fuſeli's Pilkington.

LOMBARD, Peter, a biſhop of Paris, who flouriſhed in the twelfth century, and known under the title of "Maſter of the Sentences," was a native of Novara in Lombardy, from which he derived his ſurname. He received his education at Bologna, celebrated at that time for its univerſity, and its very eminent profeſſors of the civil law. His mind was bent on theological purſuits, and he was encouraged to devote himſelf to them by the biſhop of Lucca, who recommended him to St. Bernard, by whoſe aſſiſtance he was enabled to proſecute his ſtudies at Rheims. He afterwards removed to Paris, and from his reputation for learning, obtained a profeſſorſhip in the univerſity, and was preſented with the canonry of Chartres, which was followed by his elevation to the epiſcopal dignity, for which he was indebted to the regard entertained for him by his pupil, Philip, ſon of Lewis le Gros. This prince was educated for the church, and in 1159 was elected biſhop, an honour which he declined in favour of his old maſter, as a mark of perſonal regard for him. Lombard did not long enjoy the dignity; he died in the year 1164. His celebrity in the ſchools was derived from his work entitled "Sententiarum, lib. iv." in which he endeavoured to illuſtrate the doctrines of the church by a collection of ſentences and paſſages drawn from the fathers whoſe contradictions he attempted to reconcile. This work was received with univerſal applauſe, and acquired ſo high an authority among the ſchoolmen, that the moſt learned doctors were employed in illuſtrating and expounding it. The abbè Fleury makes the number of commentators on it amount to two hundred and forty-four. It was firſt printed at Venice in 1477, and has undergone a multitude of impreſſions at different times and in different places. Moreri.

LOMBARDS, or rather Langobards, which was their original name, deduced from the peculiar length and faſhion of their beards, *lang* ſignifying *long*, and *baert*, *beard*, whereas the corrupt appellation of *Lombards* was diffuſed in the 13th century by the merchants and bankers, who were the Italian poſterity of the ſavage warriors to whom the name originally belonged, denote a tribe of people who aroſe from an obſcure and ſmall beginning to occupy the moſt conſiderable rank in Europe. The Scandinavian origin of theſe people is maintained by Paul the Deacon, conteſted by Cluverius, and defended by Grotius. It would be tedious, and alſo unſatisfactory to the reader, if we were to make an attempt at purſuing the migrations of the Lombards through unknown regions and marvellous adventures. About the time of Auguſtus and Trajan theſe fierce people were diſcovered between the Elbe and the Oder. They were fierce beyond the example of the Germans, and they took pleaſure in propagating the tremendous belief, that their heads were formed like the heads of dogs, and that they drank the blood of their enemies whom they vanquiſhed in battle. From the north they gradually deſcended towards the ſouth and the Danube; and after an interval of 400 years, they again appear with their ancient valour and renown. Their manners were not leſs ferocious. The aſſaſſination of a royal gueſt was executed in the preſence, and by the command, of the king's daughter, who had been provoked by ſome words of inſult, and diſappointed by his diminutive ſtature. The victories of the Lombards recommended them to the friendſhip of the emperors; and at the ſolicitation of Juſtinian, they paſſed the Danube, to reduce, according to their treaty, the cities of Noricum and the fortreſſes of Pannonia. But urged onward by a ſpirit of rapine, they wandered along the coaſts of the Adriatic as far as the Dyrrachium, and preſumed, as the hiſtorian ſays, with familiar rudeneſs, to enter the towns and houſes of their Roman allies, and to ſeize the captives who had eſcaped from their audacious hands. Theſe acts of hoſtility, charged upon ſome looſe adventurers, were diſowned by the nation, and excuſed by the emperor: but the arms of the Lombards were more ſeriouſly engaged by a conteſt of 30 years, which was terminated only by the extirpation of the Gepidæ. Of the cauſe and event of the quarrel between the Lombards and the Gepidæ we have already given an account under the biographical article *Alboin*. In conſequence of the victory gained by the Lombards, aſſiſted by the Avari, a Scythian horde, over the Gepidæ, A.D. 566, no further obſtacle could impede the progreſs of the confederates, and they faithfully executed the terms of their agreement. Having captured Milan, the capital of Liguria, the Lombards, with joyful acclamations, proclaimed and ſaluted Alboin king of Italy; raiſing him upon a ſhield in the midſt of the army according to the cuſtom of their nation, and preſenting him with a lance, which among them was the enſign of royalty. From this time, A.D. 570, hiſtorians date the beginning of the kingdom of Lombards in Italy, which laſted above 200 years. After this event he extended his conqueſts, and his progreſs was rapid in the reduction of the greateſt part of Italy. Pavia held out for more than three years; but it was at length conſtrained to ſurrender to the arms of Alboin; and as it was a city of great ſtrength, and conveniently ſituated, this ſovereign and his ſucceſſors choſe it for the place of their reſidence; and thus it became the metropolis of the kingdom of the Lombards. After his death (ſee ALBOIN,) Clepho, one of the nobleſt

Lombard chiefs, was unanimouſly elected as his ſucceſſor: his reign was terminated before the expiration of eighteen months by the hand of an aſſaſſin, and during the minority of his ſon Autharis, Italy was divided and oppreſſed by a ducal ariſtocracy of 30 tyrants. After an interval of diſtraction, which laſted 10 years, Autharis attained the ſtrength and reputation of a warrior. Under the ſtandard of their new king, the conquerors of Italy withſtood their ſucceſſive invaſions; and the victorious Autharis aſſerted his claim to the dominion of Italy. However, he allowed the dukes, who for 10 years had exerciſed abſolute authority in their reſpective dukedoms, to continue in their governments; but he obliged them to contribute one moiety of their revenue to the maintenance and ſupport of his royal dignity. He alſo bound them, by an oath, to aſſiſt him in time of war to the utmoſt of their power. As he did not deprive them of their dukedoms, except in caſes of treaſon, he did not transfer them to others, but when their male iſſue failed: and this was the origin of fiefs in Italy. Some, indeed, have imagined that fiefs were firſt introduced by the Lombards, and from them adopted by other nations. But it appears, that fiefs had been introduced into Gaul by the Franks ſome years before the reign of Autharis, who firſt eſtabliſhed them in Italy. All the cuſtoms and laws which were afterwards introduced and publiſhed concerning fiefs, are owing to the Lombards, who gave them a certain and regular form; ſo that, among all other nations, ſucceſſions, acquiſitions, inveſtitures, and every thing elſe relating to fiefs, were regulated by the cuſtoms and laws of the Lombards. Hereupon a new body of laws ſprung up, which were called feudal laws, and which continued in ſome provinces of Italy, and particularly in the kingdom of Naples, to be the chief part of the juriſprudence.

Autharis, having ſettled matters with the dukes in the manner now mentioned, enacted ſeveral reaſonable and ſalutary laws againſt theft, rapine, murder, adultery, and other crimes which at that time prevailed among his ſubjects. He was alſo the firſt of the Lombard kings, who, renouncing Paganiſm, embraced the Chriſtian religion, and his example was followed by moſt of his ſubjects.

At the foot of the Rhætian Alps, Autharis ſubdued the reſiſtance, and rifled the hidden treaſures of a ſequeſtered iſland in the lake of Comum; and at the extreme point of Calabria, he touched with his ſpear a column on the ſea-ſhore of Rhegium, proclaiming that ancient landmark to ſtand the immoveable boundary of his kingdom. Autharis cloſed his life and reign at Pavia, A.D. 590. Agilulf, his ſucceſſor, renounced the opinions of Arius, which had been countenanced by Autharis, and embraced the Catholic faith. Agilulf was ſucceeded A.D. 615, by his ſon Adaluald, who being depoſed, had for his ſucceſſor Ariovald, under whoſe government the Lombards enjoyed tranquillity both at home and abroad. Upon his death, A.D. 636, Rotharis aſcended the throne, who is the firſt who gave written laws to the Lombards. From the year 638 to the reign of Luitprand, no acts of hoſtility occurred between the exarchs and the kings of the Lombards: the latter being ſatisfied with their new conqueſts, and the former being glad to enjoy unmoleſted the territories that remained under the dominion of the emperor. Luitprand, who aſcended the throne A.D. 711, may be accounted, next to Rotharis, the chief lawgiver of the Lombards: but influenced by ambition he undertook to drive the Romans out of Italy, and this enterpriſe occaſioned the ruin of the kingdom of the Lombards in that country. Luitprand invaded the exarchate, and reduced Ravenna, and ſeveral other cities of the exarchate, which he formed into a dukedom. Ravenna was afterwards recovered by the exarchate: but taken again by Aſtulphus, who changed it into a dukedom. The popes had been alarmed, and made application to Pepin, king of France, for aſſiſtance and protection. Accordingly Pepin was perſuaded to make war upon the Lombards: and, in the year 754, entered Italy, and beſieged Aſtulphus in his metropolis. Rome was twice reſcued from the attacks of the Lombards, A.D. 754. At length the paſſes of the Alps, and the walls of Pavia, were their only defence: the former were ſurpriſed, and the latter were inveſted by Charlemagne, the ſon of Pepin; and after a blockade of two years, Deſiderius, the laſt of their native princes, ſurrendered his ſceptre and his capital, A.D. 774. Thus ended the kingdom of the Lombards in Italy, after they had poſſeſſed that country for 206 years. Under the dominion of a foreign king, but in the poſſeſſion of their national laws, the Lombards became the brethren, rather than the ſubjects, of the Franks; who derived their blood, and manners and language, from the ſame Germanic origin. Anc. Univ. Hiſt. vol. 17. Gibbon.

During a period of 200 years Italy was unequally divided between the kingdom of the Lombards and the exarchate of Ravenna. (See Exarch.) From Pavia, the royal ſeat, the kingdom of the Lombards was extended to the eaſt, the north, and the weſt, as far as the confines of the Avari, the Bavarians, and the Franks of Auſtraſia and Burgundy. In the language of modern geography it is now repreſented by the Terra firma of the Venetian republic, Tyrol, the Milaneſe, Piedmont, the coaſt of Genoa, Mantua, Parma, and Modena, the grand duchy of Tuſcany, and a large portion of the eccleſiaſtical ſtate from Perugia to the Adriatic. The dukes, and at length the princes of Beneventum, ſurvived the monarchy and propagated the name of the Lombards. From Capua to Tarentum, they reigned near 500 years over the greateſt part of the preſent kingdom of Naples. In proceſs of time, the diſpoſition and manners of the Lombards underwent a very important change. So rapid, indeed, was the influence of climate and example, that the Lombards of the fourth generation ſurveyed with curioſity and affright the portraits of their ſavage forefathers. The government of the Lombards was an elective monarchy: and the public revenues aroſe from the produce of land and the profits of juſtice. The Lombards were at firſt a cruel and barbarous people; but diveſting themſelves, by degrees, of their native ferocity and barbarity, eſpecially after they had embraced the Chriſtian religion, they governed with ſuch equity and mildneſs, that moſt other nations envied the happineſs of thoſe who lived under their adminiſtration.

As they had no other kingdom, nor dominions, Italy became their own country; whence the natives eſteemed their kings as their natural princes, not thinking themſelves governed, much leſs kept in ſlavery, by a foreign nation, as it happened to them afterwards, when, by frequent changes, they groaned under the heavy yoke, ſometimes of one nation, and ſometimes of another. Under the government of the Lombards, ſays Paulus Diaconus, no violence was committed, no one unjuſtly diſpoſſeſſed of his property, none oppreſſed with taxes; theft, robberies, murder, and adultery, were ſeldom heard of; every one went, without the leaſt apprehenſion of danger, whither he pleaſed: and indeed their many wholeſome laws, reſtraining and ſeverely puniſhing all ſorts of crimes; the magnificent churches, and rich monaſteries, with which they filled that part of Italy which was ſubject to them; the many biſhoprics which they erected; the towns and cities which they either built, or repaired, in moſt provinces of Italy; their generoſity even to the biſhop of Rome, their avowed enemy; and, ſinally, the great number of perſons among them, whoſe ſanctity and eminent virtues have been acknowledged by the popes themſelves, muſt convince every impartial reader, that the Lombards were not ſuch a ſavage, barbarous, and inhuman nation, as they are deſcribed by ſome of the popes, eſpecially by Adrian, the chief author of the ruin of their kingdom. They were the only power in Italy capable of defeating the ambitious views of the biſhops of Rome; whom they would not ſuffer to enrich themſelves with the ſpoils of the emperors, but conſidered them as their own by right of conqueſt; and hence aroſe the inveterate hatred which the popes bore them, and could not help betraying in all their writings. But their laws are convincing proofs of their juſtice, humanity, and wiſdom, and, at the ſame time, a full confutation of the many calumnies, with which the popes, and their partiſans, have endeavoured to aſperſe them. Their laws were found ſo juſt and equitable, that they were retained in Italy, and obſerved ſome ages after their kingdom was at an end.

Lombards, a name given in the Netherlands, France, and England, to lending-houſes. (See Loan-*banks*.) It is well known that in the thirteenth and following centuries many opulent merchants of Italy, which at thoſe periods was almoſt the only part of Europe that carried on an extenſive trade, were invited to theſe countries, where there were few mercantile people able to engage deeply in commerce. For this reaſon they were favoured by governments in moſt of the large cities; but in the courſe of time they became objects of univerſal hatred, becauſe they exerciſed the moſt oppreſſive uſury, by lending at intereſt and on pledges. They were called *Longobardi* or *Lombardi*, as whole nations are often named after a part of their country, in the ſame manner as all the Helvetians are called Swiſs, and the Ruſſians ſometimes Moſcovites. They were, however, called frequently alſo Caorcini, Caturcini, Caurſini, Cawarſini, Cawartini, Bardi, and Amanati; names which, in all probability, aroſe from ſome of their greateſt houſes or banks. We know, at any rate, that about thoſe periods the family of the Corſini were in great conſideration at Florence. They had banks in the principal towns for lending money; they demanded exorbitant intereſt; and they received pledges at a low value, and retained them as their own property if not redeemed at the ſtated time. They eluded the prohibition of the church againſt intereſt when they found it neceſſary, by cauſing the intereſt to be previouſly paid as a preſent or premium; and it appears that ſome ſovereigns borrowed money from them on theſe conditions. In this manner did Edward III., king of England, when travelling through France, in the year 1329, receive 5000 marks from the bank of the Bardi, and give them in return, by way of acknowledgment, a bond for 7000. When complaints againſt the uſurious practices of theſe Chriſtian Jews became too loud to be diſregarded, they were threatened with expulſion from the country, and thoſe who had rendered themſelves moſt obnoxious on that account, were often baniſhed, ſo that thoſe who remained were obliged to conduct their employment with more prudence and moderation. It is probable that the commerce of theſe countries was then in too infant a ſtate to diſpenſe altogether with the aſſiſtance of theſe foreigners. In this manner were they treated by Louis IX. in 1268, and likewiſe by Philip the Bold; and ſometimes the popes, who would not authoriſe intereſt, lent their aſſiſtance by prohibitions, as was the caſe in regard to Henry III. of England in 1240.

In the fourteenth century, the Lombards, in the Netherlands, paid to government rent for the houſes in which they carried on their money tranſactions, and ſomething beſides for a permiſſion. Of this we have inſtances at Delft in 1313, and at Dordrecht in 1342. As in the courſe of time the original Lombards became extinct, theſe houſes were let, with the ſame permiſſion, for the like employment; but governments at length fixed the rate of intereſt which they ought to receive, and eſtabliſhed regulations for them, by which uſurious practices were reſtrained. Of leaſes granted on ſuch conditions, an inſtance occurs at Delft in the year 1655. In 1578, William prince of Orange recommended to the magiſtrates of Amſterdam Francis Maſaſia, one of the Lombards, as they were then called, in order that he might obtain for him permiſſion to eſtabliſh a lending-houſe; as many obtained permiſſion to keep billiard-tables, and Jews letters of protection. In the year 1611, the proprietor of ſuch a houſe at Amſterdam, who in the latter years of his leaſe had gained by his capital at leaſt thirty-three and a half per cent. offered a very large ſum for a renewal of his permiſſion; but, in 1614, the city reſolved to take the lombard or lending-houſe into their own hands, or to eſtabliſh one of the ſame kind. However deteſted this plan might be, a diſpute aroſe reſpecting the legality of it, which Marets and Claude Saumaiſe endeavoured to ſupport. The public lending-houſe or lombard at Bruſſels was eſtabliſhed in 1619; that at Antwerp in 1620, and that at Ghent in 1622. All theſe were eſtabliſhed by the archduke Albert, when he entered on the governorſhip, with the advice of the archbiſhop of Mechlin; and on this occaſion the architect Wenceſlaus Coberger was employed, and appointed inſpector-general of all the lending-houſes in the Spaniſh Netherlands. Some Italians aſſert, that the Flemings were the firſt people who borrowed money on intereſt for their lending-houſes; and they tell us that this practice began in the year 1619. We are aſſured alſo, that, after long deliberation at Bruſſels, it was at length reſolved to receive money on intereſt at the lending-houſes. It however appears certain, that in Italy this was never done, or at leaſt not done till a late period, and that the capitals of the lending-houſes there were amaſſed without giving intereſt.

This beneficial inſtitution was always oppoſed in France; chiefly, becauſe the doctors of the Sorbonne could not diveſt themſelves of the prejudice againſt intereſt; and ſome in modern times who undertook there to accommodate people with money on the like terms, were puniſhed by government. A lending-houſe, however, was eſtabliſhed at Paris, under Louis XIII., in 1626; but the managers next year were obliged to abandon it. In 1695, ſome perſons formed a capital at Marſeilles for the purpoſe of eſtabliſhing one there according to the plan of thoſe in Italy. The *mont de pieté* at Paris, which has had ſometimes in its poſſeſſion forty caſks filled with gold watches that have been pledged, was, by royal command, firſt eſtabliſhed in 1777. Beckmann's Hiſt. of Inventions, vol. iii.

LOMBARDY, in *Geography*, a country in the northern part of Italy, very much correſponding with the Ciſalpine Gaul of the Romans. It derived its name from the Lombards, (ſee the article Lombards,) who founded the kingdom in the middle of the ſixth century. This country was divided into ſeveral ſtates, ſubject to the houſe of Auſtria, the republic of Venice, and the king of Sardinia; ſuch as the duchies of Milan and Mantua, called Auſtrian Lombardy; the Paduan, Veroneſe, Vicentin, Breſſan, Comaſco, Bergamaſco, belonging to Venice:—Montſerrat and Nice, annexed to Piedmont, ſubject to the king of Sardinia;—together with many others, as the duchies of Modena, Reggio, Parma, Piacenza, Mirandola, and ſeveral ſmaller principalities and ſtates. The viciſſitudes which Lombardy has undergone, and more eſpecially thoſe which have occurred to it ſince the French revolution, are briefly detailed under Cisalpine *Republic*, and Italy. See likewiſe each of the above enumerated articles.

LOMBE'S, a town of France, and principal place of a diſtrict in the department of the Gers, the ſee of a biſhop before the revolution; 16 miles S.E. of Auch. The place contains 1443, and the canton 12,145 inhabitants, on a territory of 290 kiliometres, in 39 communes.

LOMBOK, an iſland in the Eaſt Indian ſea, about 40 miles from N. to S. and from 18 to 30 broad, chiefly inhabited by Gentoos; between which and Cumbava is a paſſage, called the "Straits of Lombok."—Alſo, a town on the E. coaſt of the ſame iſland. S. lat. 8° 42′. E. long. 116 2′.

LOMBUZSKOI, a ſmall iſland in the Frozen ocean; near the coaſt of Ruſſia; 180 miles E. of Kola. N. lat. 67° 55′. E. long 40° 14′.

LOMBY, a town of Hindooſtan, in the Carnatic; 20 miles N.W. of Tiagar.

LOMEIR, John, in *Biography*, a learned Dutch Proteſtant divine, paſtor of the church of Dotekum in Zutphen, was author of a curious little work abounding in erudition and deep reſearch, in which he has undertaken to give hiſtorical and critical notices of the moſt celebrated libraries in ancient and modern times. It is entitled "De Bibliothecis Liber Singularis;" 12mo. The author's plan gave riſe to a larger work on the ſame ſubject, by Maderus, a learned German, who publiſhed at Helmſtadt a treatiſe "De Bibliothecis," in two vols. 4to., in which he has inſerted Lomeir's piece.

LOMENTACEÆ, in *Botany*, a natural order of plants, the 33d among the *Fragmenta* of Linnæus, named, as it ſhould ſeem, from *lomentum*, the meal of beans, in alluſion to the pulſe-like nature of the plants in queſtion, ſo as to keep in view their analogy with the *Papilionaceæ*. They are included in the three firſt ſections of Juſſieu's *Leguminoſæ*, or nearly ſo; ſee that article. *Polygala* indeed, placed here by Linnæus, is referred by Juſſieu to the *Pediculares*.

LOMENTUM, a word uſed by the old writers on medicine to expreſs a meal made of beans, or bread made of this meal, and uſed as a waſh. See Detersorium.

Others have applied it to the French chalk, or morochthus, uſed by the ſcowerers of clothes, which is brought over in large cakes, reſembling loaves or cakes of bread.

LOMGRAD, in *Geography*, a town of Bulgaria, at the conflux of the river Lom with the Danube; 20 miles S.S.E. of Viddin.

LOMI, a town of Ruſſia, in the government of Irkutſh, on the Amul; 16 miles N. of Stretenſk.

LOMMETSCH, or Lumtszch, a town of Saxony, in the margravate of Meiſſen; ſeven miles N.W. of Meiſſen. N. lat. 51 11′. E. long. 13° 13′.

LOMMIUS, Jodocus, (Van Lom, in his native language,) in *Biography*, a medical writer of reputation, was born at Buren, in Guelderland, about the commencement of the ſixteenth century. His father, who was town-clerk of that place, took great care of his education. He was already well verſed in the Latin and Greek languages, when he turned his attention to medicine, which he ſtudied principally at Paris, where his talents and aſſiduity obtained him the friendſhip of Fernel. It is not known where he took his degree; but he practiſed for a conſiderable time at Tournay, to which city he was penſionary-phyſician in 1557; and he removed to Bruſſels, at an advanced period of life, about the year 1560. He was living in this city in 1562, beyond which period there is no record of him. He left three ſmall works, which are ſtill held in eſtimation in conſequence of the purity and elegance of the Latinity in which they are written: theſe are "Commentarii de Sanitate tuenda in primum librum C. Celſi," Louvain, 1558, 12mo. This is an ample commentary upon Celſus, taken entirely from the ancients. "Obſervationum Medicinalium Libri tres," Antwerp, 1560. This work has paſſed through many editions: it conſiſts of hiſtories of diſeaſe, related with the ſimple perſpicuity of Celſus, and containing many uſeful and valuable obſervations on the diagnoſtics, prognoſtics, and cure. "De curandis Febribus continuis Liber," Antwerp, 1563. This little treatiſe, like the foregoing, has been ſeveral times printed and tranſlated. Theſe works were publiſhed together at Amſterdam, in 1745, in three vols. 12mo., under the title of "Opera omnia." Eloy Dict. Hiſt.

LOMNITZ, in *Geography*, a town of Bohemia, in the circle of Konigingratz; ſix miles N. of Gitſchin.—Alſo, a town of Moravia, in the circle of Brunn; 15 miles N.N.W. of Brunn. N. lat. 49° 24′. E. long. 16° 18′.

Lomnitz *Peak*. See Carpathian *Mountains*.

LOMOND, Loch, a lake ſituated in the county of Dunbarton, Scotland. It is the fineſt and moſt beautiful expanſe of water in that country, and not ſurpaſſed, in variety and magnificence of ſcenery, by any in Great Britain. This lake extends about twenty-ſix miles in length from north to ſouth, and varies from one to eight miles in breadth. The broadeſt portion is towards the ſouth. As it approaches the north, it gradually contracts. Here it is much deeper than in the broader parts. At the foot of Benlomond the depth is about 120 fathoms, but in the ſouth diviſion it is not generally much above 14 fathoms. The northern and deeper part of this lake is never covered with ice even in the ſevereſt froſts, but ſouth from Luſs, it is often frozen over ſo completely, that not only men but loaded horſes can paſs over it to the different iſlands in perfect ſafety.

Loch Lomond is ſupplied with water from ſeveral rivers, beſides ſmaller ſtreams from the mountains. It has, however, but one way of diſcharging itſelf; and this is the reaſon why it ſwells in wet ſeaſons even ſo high as ſix feet above its uſual level. Fiſh are caught here in great abundance, particularly ſalmon trout, eels, and pearches, as likewiſe a ſpecies called pollocks, which reſemble in appearance and flavour the large herrings.

The beauties of this lake have often been the ſubject of deſcription, both in poetry and proſe. Theſe ſeem chiefly to ariſe from the woods in its vicinity, the number and variety of its iſlands, and the near approach of the terrific Grampians, which afford a ſtriking contraſt to the more placid ſcenery immediately adjacent. At the houſe of Cameron, placed at the ſouthern extremity of the lake, the whole charms of this delightful expanſe are in full view. After paſſing this manſion, the road ſkirts along the weſtern bank, ſometimes loſing itſelf among the natural foliage that clothes the brow of the mountains, and at other times emerging into a more free ſpace; thereby preſenting in ſucceſſion a variety of views of the lake, iſlands, and neighbourhood, highly captivating and delightful.

The iſlands in Loch Lomond, ſmall and great, are uſualy reckoned to be thirty in number. Moſt of them are finely wooded, but not above ten are of any conſiderable ſize. The principal ones are the property of the duke of Montroſe and ſir James Colquhoun of Luſs. Inchcailloch, or the iſland of old women, ſo called from a nunnery formerly there, was at one time the ſcite of the church of Buchanan in Stirlingſhire. Inchmurin is the moſt valuable iſland in the lake, and has a deer park belonging to the duke of Montroſe. The iſland of Inch-tavanach, *i. e.* the iſland of the monk's-houſe, derives its name from the circumſtance of a monk having fixed his reſidence here at a very remote period. The other iſlands are not deſerving of particular notice, except as all contributing, by the beauty of their verdure, to render the whole ſcenery more intereſting and varied than it otherwiſe would be.

Loch Lomond has long been celebrated for three wonders, "fiſh without fins, waves without wind, and a floating iſland." The fiſh without fins are manifeſtly vipers, which abound here in great plenty, and ſometimes ſwim from one iſland to another. Waves without wind are common to this lake, with all extenſive deep waters, when a calm immediately ſucceeds a ſtorm. The floating iſland is now fixed near the weſt ſhore of the iſle of Inchconagan, and if it ever did float, muſt be conſidered as a moſſy fragment bound together by the matted roots of coarſe graſſes, willows, Dutch myrtles, &c.

The waters of this lake are ſuppoſed to be riſing in height. Acroſs the channel of a ſtream called Falloch, at the northern extremity, there are a number of ſtones fixed regularly, and evidently intended for enabling paſſengers to croſs from one ſide to the other, which are now however covered with at leaſt five feet of water. Near the middle of the bay of Camſtraddan, when the water is low, there is a heap of ſtones viſible, which is ſaid to have formerly compoſed the reſidence of the Colquhouns of Camſtraddan. Camden, in his Atlas Britannica, mentions an iſland exiſting here in his day, with a houſe and garden upon it. About five miles to the ſouth of this heap of ſtones there is another, ſaid to be the ruins of an ancient church: the field oppoſite to it is ſtill called Church-field.

The village of Luſs is delightfully ſeated on the weſtern bank of the lake, and on the poſt road from Glaſgow to Inverary. In the immediate vicinity of this village, Roſedoe, the manſion houſe of ſir James Colquhoun of Luſs, is placed on a rich peninſula, projecting ſo far into the lake as to appear inſulated. The ground is finely wooded, and a tower of the ancient caſtle, or habitation of the family, forms an excellent contraſt to the modern houſe. Some very bold and rugged mountains compoſe the back ground of this charming ſcenery. Between Luſs and Tarbet the road diminiſhes in breadth very rapidly. Paſſing the water of Uglas, which diſcharges itſelf into the lake, it aſcends a lofty promontory, projecting conſiderably in the lake, which is called the point of Firkin. The aſcent to the ſummit of this eminence is abrupt, difficult, and tedious, but the view which diſplays itſelf from it amply repays the admirer of nature for the labour attending it. Nearly oppoſite to this point Benlomond rears his lofty head on the eaſtern ſide. For a deſcription of this mountain and its ſcenery, ſee the article BENLOMOND.

LOMOND *Hills*, two beautiful conical hills ſituated in the county of Fife, Scotland. The eaſtern one is by far the moſt beautiful, and riſes 1650 feet above the level of the town of Falkland, which is placed at a ſhort diſtance from its baſe. It appears to have been the ſeat of a fort in ancient times. On the very ſummit is a ſmall lake, which has probably been the *crater* of an extinct volcano. On this hill a mine of lead has been lately opened with good proſpects of ſucceſs to the proprietors. It likewiſe contains coal and limeſtone in conſiderable abundance, but neither of them are wrought. The other hill, which is called Weſtern Lomond, from its ſituation with reſpect to the former, is much higher than it, and perhaps commands a more extenſive view. On the top is one of thoſe heaps or tumuli of ſtones which are denominated cairns.

LOMONOZOF, in *Biography*, accounted the father of Ruſſian poetry, was born at Kolmogori in 1711, where his father was a dealer in fiſh. He poſſeſſed the rare advantage of perſons in his ſtation, of learning to read his native language, and caught a flame of poetical inſpiration by peruſing a tranſlation of Solomon's ſong into rude verſe. His love of learning induced him to leave his father, and take refuge in a monaſtery at Moſcow, where he laid a good foundation in the learned languages, and diſplayed ſuch talents, that he was ſent by the Imperial Academy for improvement to the German univerſity of Marpurg. He ſtudied under Wolf and the other celebrated profeſſors. On his return to his native country he was elected adjunct, and then member of the Imperial Academy, and profeſſor of chemiſtry, in which ſcience he was a conſiderable adept, having ſtudied it under Kunckel at Freyburg in Saxony. In 1764 he was honoured with the title of counſellor of ſtate. He died in the ſame year. His reputation as a literary man is founded on his poetical compoſitions, which are numerous and various in their kinds. His odes are admired for their ſpirit and ſublimity, in which he is ſaid to rival Pindar. In theſe, and in his other poems, he was the creator of various meaſures new to Ruſſian verſe, ſo that he ranks as its greateſt benefactor. He was author likewiſe of tragedies, idylls, and epiſtles, and he left a fragment of an epic poem on Peter the Great. He publiſhed ſome chemical and philoſophical tracts, and two ſhort pieces on the hiſtory of Ruſſia, and he enriched the language of his country with ſome tranſlations from the Greek and Latin.

LOMPAR, in *Geography*, a ſmall iſland in the Baltic, near the S.E. coaſt of Aland. N. lat. 60° 10′. E. long. 20° 9′.

LOMWIA, in *Ornithology*, the name of a web-footed water-fowl common on the Engliſh ſhores, and called in different places the *guillem*, *guillemot*, *ſea-hen*, *kiddaw*, and *ſkout*: the laſt name, however, is ſomewhat equivocal, as the Scotch call the common *razor-bill* by this name. See COLYMBUS *Troile*.

LOMZA, in *Geography*, a town of the duchy of Warſaw, ſituated on the Narew; 80 miles N.E. of Warſaw. N. lat. 53°. E. long. 22° 40′.

LONAS, in *Botany*, Adanſ. Fam. v. 2 118. Gærtn. v. 2. 396. t. 165, a genus eſtabliſhed by thoſe authors upon the *Achillea inodora*, Linn. Sp. Pl. 1265, *Athanaſia annua*, Syſt. Veg. ed. 14. 741.

LONATO, or LONADO, in *Geography*, a town of Italy, in the department of the Benaco; 12 miles E.S.E. of Breſcia.

LONCHITIS, in *Botany*, a name derived from λογχη, *a ſpear*, borrowed from the Greeks, and applied by Tournefort to what he eſteemed a diſtinct genus of ferns, characterized by having auricled leaflets. Linnæus has retained it for one of the ſame family, better defined by the fructification, of which we are now to ſpeak. The λογχῖτις of Dioſcorides has always been a ſubject of diſpute, though his deſcription is more full and preciſe than uſual. Some have thought it *Iris tuberoſa*, others *Serapias Lingua*. His λογχῖτις ἑτέρα however does appear to be a fern.—Linn. Gen. 560. Schreb. 757. Mart. Mill. Dict. v. 3. Sm. Mem. de l'Acad. de Turin. v. 5. 413. Tracts 244. Swartz. Syn. Fil. 93. Sprengel. Crypt. 127. t. 4. f. 27. Juſſ. 15. Lamarck Illuſtr. t. 868.—Claſs and order, *Cryptogamia Filices*. Nat. Ord. *Filices*, Linn. Juſſ.

Gen. Ch. *Capſules* annulated, numerouſly aſſembled in creſcent-ſhaped, ſhort, when young often divided, lines, in the margin of each ſinus of the leaves. *Involucrum* membranous, proceeding from the margin of the leaf, inflexed, often divided in the middle.

Eſſ. Ch. Fructification in creſcent-ſhaped ſpots, in the ſinuſes of the leaves. Involucrum from the inflexed margin of the leaf, ſeparating inwards.

1. L. *aurita.* Linn. Sp. Pl. 1536. (Filix latifolia, ſpinulis mollibus et nigris aculeata; Plum. Fil. 14. t. 17. Petiv. Fil. t. 4. f. 4.—Frond pinnate; pinnatifid; the lower pair of leaflets divided; lobes obtuſe, ſmooth, wavy, toothed at the ſummit. Stalk prickly.—This ſpecies, which Plumier only appears to have ſeen, was gathered by him in the courſe of a valley, in a diſtrict of Martinico, commonly called *le Preſcheur.* The *root* conſiſts of numerous, black, entangled fibres. *Fronds* five or ſix, erect, about a foot and a half high; their ſtalks browniſh, poliſhed, clothed with numerous, horizontal, black, pliant prickles. The upper half of the plant conſiſts of a few nearly oppoſite pairs of long and broadiſh, pinnatifid, pointed *leaves,* or *pinnæ,* very thin, membranous, ſmooth, delicate, and finely veined, of a bright green. Their ſegments are ſeparated rather more than half way to the rib, broadiſh, wavy at the edges, toothed at their blunt apex, and bearing at their ſinuſes, between each other, a creſcent-ſhaped thick maſs of *fructification,* which ſeems not to be cloven or divided.

2. L. *hirſuta.* Linn. Sp. Pl. 1536. (Filix villoſa, pinnulis quercinis; Plum. Fil. 16. t. 20. Petiv. Fil. t. 4. f. 5.)—Frond hairy, doubly pinnate; deeply pinnatifid; lobes ſinuated, obtuſe, wavy, many-flowered.—Gathered by Plumier by rivers in Martinico; by R. Shakeſpear in Jamaica. We have alſo ſpecimens from J. V. Thompſon, eſq. collected by him in ſome part of the Weſt Indies; yet this ſpecies is very rare. It differs widely from the former in its hairineſs and much greater ſize, being five or ſix feet high, and the *ſtalks* near an inch thick. The *frond* moreover is doubly pinnate, either in an alternate or oppoſite manner; its *leaves* very deeply pinnatifid, pointed, their obtuſe ſegments alſo pinnatifid, or at leaſt deeply ſinuated, each ſinus bearing a creſcent-ſhaped maſs of ſeeds, or rather two ſeparate maſſes, each with its own roundiſh *involucrum,* not unlike that of an *Adiantum,* though they finally, for the moſt part, coaleſce.

3. L. *javanica.* Lamarck Dict. v. 3. 594. Swartz Syn. Fil. 94.—Frond hairy, once or twice pinnate; deeply pinnatifid; lobes ſinuated, pointed, crenate, many-flowered. Involucrum ſimple.—Gathered by Commerſon in Java, according to Lamarck, though the ſpecimen given to the younger Linnæus by Thouin is marked as coming from the Mauritius. It ſeems at any rate to be of Eaſt, not Weſt, Indian origin, and differs eſſentially from the foregoing. How often the *frond* is decompounded, we have not materials to determine. Our ſpecimen has two oppoſite *pinnæ* only, each above a foot long, pointed, very deeply pinnatifid, clothed with fine ſoft pubeſcence, beautifully reticulated with veins; dark-green above, brighter beneath. The ſegments are likewiſe ſharp-pointed, about fifteen pair, deeply ſinuated, crenate. One thick, brown, ſemilunar maſs of *fructification,* ſtands in each ſinus, and is, as far as we can diſcern, ſimple and undivided, as well as its *involucrum.*

4. L. *glabra.* Swartz. n. 3. Bory de St. Vincent Voy. v. 1. 321.—"Frond doubly compound, ſmooth; leaves ſomewhat pinnate; their diviſions deeply crenate."—Native of the iſle de Bourbon. We know nothing of this ſpecies but the above character, which, except as to ſmoothneſs, gives no very preciſe information.

5. L. *repens.* Linn. Sp. Pl. 1536. (Filix aculeata repens; Plum. Fil. 11. t. 12. Petiv. Fil. t. 4. f. 6.)—Frond thrice pinnate; leaves deeply pinnatifid; lobes ſinuated, obtuſe, crenate. Stalks prickly. Root creeping.—Gathered by Plumier in Martinico. He deſcribed the *root* as extremely long, creeping like couchgraſs, half the thickneſs of the finger, black both within and without. *Fronds* ſpreading horizontally and very widely. Their general and partial ſtalks prickly, twice pinnate, in an alternate order. *Leaves* about ſix inches long, pointed, very deeply pinnatifid, if not pinnate; their ſegments oblong, obtuſe, deeply ſinuated. *Fructification* ſmall, apparently ſolitary in each ſinus. We know not on what grounds Linnæus fixed the genus of this ſpecies, which no other botaniſt than Plumier appears to have ſeen. As far as his figure goes, it may belong to *Dickſonia,* or *Cyathea,* as probably as to *Lonchitis.*

The L. *pedata* of Linnæus, *Sp. Pl.* 1536, like a few others named or publiſhed by different botaniſts, belong rather to *Pteris,* betwixt which genus and the preſent, it is not always eaſy to draw a line.

LONCHIURUS, in *Natural Hiſtory,* a genus of fiſhes of the order thoracici: pectoral fins ſeparate; tail lanceolate. There is only one ſpecies, *viz.* the *barbatus,* brown, with two cirri under the chin, which is about ten inches long, and inhabits the rivers of Surinam.

LONDINIARES, in *Geography,* a town of France, in the department of the Lower Seine, and chief place of a canton, in the diſtrict of Neufchâtel; 7 miles N. of Neufchatel. The place contains 764, and the canton 5691 inhabitants, on a territory of 225 kiliometres in 32 communes.

LONDON, the metropolis of the Britiſh empire, the moſt wealthy, moſt extenſive, and probably the moſt populous and powerful city in the world, is ſeated in a fertile and ſalubrious plain or valley, on the banks of the river Thames, which divides the town into two irregular parts, and paſſes through it, from the weſt to the eaſt, in its progreſs to the ſea. Many cities and towns of antiquity have been famous in the annals of nations: Nineveh was noted for its towers and walls of vaſt circumference, height, and breadth; Babylon, for the hanging gardens, and other objects of human labour; Perſepolis, for its natural fortifications; Palmyra and Balbeck, for ſumptuous buildings; and Athens and Rome, for the civilization, refinement, and high accompliſhment of their inhabitants. But London may be denominated the modern wonder of the world. The prodigious increaſe of houſes, inhabitants, trade, commerce, and wealth, with the refinement and luxury which now prevail, render it ſuperior to all the cities of modern Europe; and muſt excite the aſtoniſhment of ſuch foreigners and Engliſhmen as have ſtudied the local and comparative hiſtories of places of note. It may be regarded as the focus of the Britiſh empire; for within its juriſdiction are concentrated the royal, legiſlative, juridical, civil, commercial, ſcientific, and literary concerns of Great Britain. Many writers have been employed, at different periods, to narrate the annals of this great town; and ſeveral volumes in folio, quarto, octavo, &c. have been excluſively devoted to the topographical hiſtory of London: but all are imperfect and unſatisfactory: the largeſt works being moſtly tedious, trivial, and prolix; and the ſmaller publications are very ſuperficial and inaccurate. At the end of this account will be given a liſt of ſeveral of theſe works; to point out the ſources of the preſent eſſay, and to furniſh the reader, who may require more circumſtantial information, with a guide to facilitate his reſearches. The following article will comprehend a general view of the hiſtory and local characteriſtics of this metropolis, with ſome particular deſcriptions; but for detailed accounts of many buildings, places, and objects, the reader is refered to the following heads, in different parts of this work: BANK *of England*, BRIDEWELL, BRIDGES, COMPANY, liſt of 91 in London, and accounts of the principal; COLLEGE *of Civilians*, or *Doctors-Commons*, COLLEGE *of Heralds*, COLLEGE *of Phyſicians*, COLLEGE, *Sion*, COLLEGE *of Surgeons*, COLLEGE, *Veterinary*, ROYAL EXCHANGE, CUSTOM *of London*, DOCKS *of London*, EXCISE, FLEET-*Priſon*, *Greſham* COLLEGE, GUILDHALL, HOSPITALS *of Bethlehem*, *Bridewell*, *Chriſt*, and *Foundling*, INNS *of Court*, INSURANCE *Companies*, ISLINGTON, LAMBETH, HACKNEY, MARY-LE-BONE, PADDINGTON, MIDDLESEX, SURRY, NEWINGTON-BUTTS, THAMES, POLICE, PARLIAMENT, NEW-RIVER, LIMEHOUSE, STRATFORD-LE-BOW, SOUTHWARK, WESTMINSTER.

The centre of London, or St. Paul's church, is aſcertained to be in latitude 51° 31′ N., and in longitude 5′ 37″ W. of Greenwich, where the royal national obſervatory is eſtabliſhed. The diſtance of London from the principal cities of Europe is as follows: from Edinburgh 395 miles S.; from Dublin 338 S.E.; from Amſterdam 190 miles W.; from Paris 225 miles N.N.W.; from Copenhagen 610 miles S.W.; from Vienna 820 miles N.W.; from Madrid 860 miles N.E. by E.; from Rome 950 miles N.N.W.; from Conſtantinople 1660 miles; from Moſcow 1660 miles E.S.E.; from Stockholm 750 miles; from Peterſburgh 1140 miles; from Berlin 540 miles; and from Liſbon 850 miles.

London, as conſidered in the aggregate, compriſes the city and its liberties, with the city and liberties of Weſtminſter, the borough of Southwark, and nearly thirty of the contiguous villages of Middleſex and Surry. The greateſt portion is built on the northern bank of the Thames, or in Middleſex; whilſt Southwark, with Lambeth, and ſeveral connecting villages, extend along the ſouthern ſhore of the ſame river, in the county of Surry. The extent of London, from weſt to eaſt, or from Knightſbridge to Poplar, is full ſeven miles and a half; whilſt its breadth, from north to ſouth, or from Newington Butts to Iſlington, is nearly five miles. The circumference of the whole, allowing for various inequalities in the extenſion of ſtreets, &c. at the extremities, cannot be leſs than thirty miles. Hence it may be fairly eſtimated, that the buildings of this metropolis cover at leaſt eighteen ſquare miles, or 11,520 ſquare acres. Out of this muſt be deducted the ſpace occupied by the river Thames, which extends about ſeven miles, or 12,320 yards in length, by one quarter of a mile, or 400 yards in width; making 1120 ſquare acres.

Independently of various local and civil diviſions, London may be ſaid to conſiſt of five diſtinguiſhing parts, or popular portions; *viz.* the weſt end of the town, the city, the eaſt end of the town, Weſtminſter, and the Borough. The "weſt end of the town," extending from Charing-Croſs to Hyde-park, and from St. James's park to Paddington, is conſidered the beſt and moſt faſhionable part of the town, and is laid out in the two great thoroughfares, called Oxford road and Piccadilly, with various handſome ſquares and ſtreets, which are chiefly occupied by the town-houſes of the nobility and gentry, and the moſt faſhionable ſhops. The "city" includes the central part, and moſt ancient diviſion of the metropolis. This is the emporium of commerce, trade, and buſineſs; and is occupied by ſhops, warehouſes, public offices, and houſes of tradeſmen and others connected with buſineſs. The "eaſt end of the town," and its inhabitants, are devoted to commerce, to ſhip-building, and to every collateral branch connected with merchandize. This diviſion of London has aſſumed a novel character ſince the commencement of the preſent century, by the vaſt commercial docks and warehouſes that have been formed and conſtructed here. The ſouthern bank of the Thames, from Deptford to Lambeth, bears ſome reſemblance to the eaſt end of the town; being occupied by perſons engaged in commercial and maritime concerns; docks, wharfs, and warehouſes being abundant. But this part of London has one diſtinguiſhing feature from any other, as it abounds with numerous and various manufactories; iron-founderies, glaſs-houſes, ſoap-boilers, dye-houſes, boat-builders, ſhot and hat manufactories, &c. and many other ſimilar eſtabliſhments. From the great number of fires employed in theſe houſes, and offenſive effluvia ariſing from ſome of the works, this diſtrict is rendered extremely unpleaſant, if not unhealthful, for human reſidence. It is therefore moſtly inhabited by workmen, labourers, and the lower claſſes of ſociety. Many improvements have lately been made, and ſeveral reſpectable houſes erected on St. George's fields. In Weſtminſter are the houſes of lords and commons, the courts of juſtice, and many offices belonging to government. Another part of the metropolis, not hitherto noticed, but which may be conſidered as the laſt enlargement, and the moſt regular and ſyſtematic in its arrangement of ſquares, ſtreets, &c. is the northern ſide of the town; comprehending a large maſs of new buildings between Holborn and Somers-town, and in the pariſhes of Mary-le-bone and Paddington. Nothing ſhews the increaſed and increaſing growth of the Engliſh metropolis more deciſively than the vaſt number of new ſquares, ſtreets, rows, and places, that have been recently erected, and are now in the progreſs of building, all round the metropolis. London is computed to contain nearly 70 ſquares, and 8000 ſtreets, lanes, rows, courts, &c. According to a cenſus obtained in the year 1811, the population of London, Weſtminſter, and their ſuburbs, was 1,099,104 perſons; being an increaſe of 133,139 within the courſe of ten years. Well might Cowper exclaim,

> "Opulent, enlarged, and ſtill increaſing London."

It would be both amuſing and intereſting to trace the progreſſive growth or expanſion of London; to deſcribe it at different and remote periods; and delineate, with a careful and accurate pencil, the natural and artificial, the political and civil, the moral and commercial characteriſtics of the Britiſh metropolis, at different epochs. Some of theſe features will be noticed in the progreſs of our ſurvey; but many muſt neceſſarily be omitted, from the peculiar nature of the preſent publication.

Ancient Hiſtory and Antiquities of London.—It is generally admitted by topographers, that the preſent ſcite of London was occupied as a Britiſh town before the arrival of the Romans. Of this, however, there is no evidence: for Geoffrey of Monmouth is not to be truſted, nor is his aſſertion entitled to reſpect. We are informed by Tacitus, that about the year 61, Londinium, or Colonia-Auguſta, "was the chief reſidence of merchants, and the great mart of trade and commerce, though not dignified with the name of a colony." (Ann. lib. xiv. c. 33.) Boadicea, the amazonian queen of the Britons, headed a large body of natives, and, after conquering Camalodunum and Verulam, took poſſeſſion of Londinium. At this time, it appears that Londinium was not fortified in the Roman manner, and was inferior to either of the other places juſt named. In a few years afterwards, the Romans made it a permanent ſtation; ſurrounded it with a fortified wall of ſtone and brick, and governed the inhabitants by Roman laws. The courſe and extent of the walls were as follows: commencing at a fort, near the preſent tower of London, the wall was carried in a line directly north to Ald-gate; thence it made a curve to the ſouth-weſt, to Biſhops-gate, from which it continued in a ſtraight line to Cripple-gate and Alders-gate; here it turned to the ſouth, and proceeded to New-gate, where it made almoſt a right angle, turning to the ſouth, to Lud-gate, and on to the banks of the Thames. The circuit of this part of the boundary, according to Stow, was nearly two miles and one furlong. Another wall, of about one mile in length, extended along the northern bank of the Thames, from the fort near the Tower to another fort near the preſent Black-friars bridge. Theſe walls were defended, at different diſtances, by ſtrong towers and baſtions. The height of the wall is ſaid to have been 22 feet, and the towers 40 feet. The ſuperficial contents of the area thus encloſed have been computed at about 400 acres. Nearly through the middle of this ſtation paſſed a ſtream, ſince called Wallbrooke. Dr. Stukeley, in his "Itinerarium Curioſum," has given a plan of Londinium, ſhewing the extent and form of the ſtation, with the number of gates in the walls, and the military roads that branched off from it. The burial-places were without the walls, on the north and eaſtern ſides of the town. Londinium was advanced from a *præfecture*, *i. e.* a town governed by a Roman præfect, to the rank of a colony. It alſo became the ſeat of the vicarius Britanniarum, and of the commiſſioners of the treaſury under the Roman emperors. To enter into accounts of all the various remains of the Romans, which have been diſcovered at different times within the limits of London, would lead us into a long diſſertation: it muſt ſuffice to ſtate, that teſſellated pavements, urns, coins, pottery, foundations of buildings, and other evident relics of the Romans, have been frequently found beneath the preſent ſurface. At the Bank, near the India houſe, and in Lombard ſtreet, ſome pavements have been taken up; and in various other parts of the city have been found evident traces of Roman habitations, and Roman cuſtoms. The London ſtone in Cannon ſtreet is conſidered, by moſt antiquaries, as part of a Roman milliary. Theſe are all particularly deſcribed in Brayley's Survey of London and Middleſex, vol. i. 1810.

Very little is known of London during the Anglo-Saxon dynaſty; nor do we know of any buildings, or other local antiquities, which may be referred to that period. Under the Saxons, London, then called Lunden, Lundone, Lundenburg, Lundenes, Lundenceaſter, gradually increaſed in extent and affluence; and, according to Bede, it then became the "emporium of many nations." Religious edifices were erected in the ſeventh century, on the ſcites of St. Paul's and Weſtminſter Abbey. It is preſumed there was a bridge acroſs the Thames, near Weſtminſter, previous to the year 994: as William of Malmſbury, when ſpeaking of the repulſe of the Danes under Sweyn and Olaf, ſays that "part of them were drowned in the river, becauſe, in their haſty rage, they took no heed of the bridge." In the time of king Athelſtan, a law was paſſed reſpecting coinage, by which it is ſpecified that London was allowed eight minters, whilſt only ſeven were appointed for the cities of Canterbury and Wincheſter.

Soon after the Roman conqueſt, a fortreſs or caſtle was built on the banks of the Thames; and this was enlarged by Gundulph, biſhop of Rocheſter, who erected the White tower, within the Tower of London. In the ſame reign St. Paul's church was commenced; and the ſtrong caſtles of Baynard and Montfichet, both of them ſtanding on the banks of the Thames within the city walls, were erected by two of the Norman king's officers, named Baynard and Montfichet. During this and ſeveral ſucceeding reigns, the public buildings of London were greatly augmented in number, by the erection of ſeveral religious edifices, abbatial and epiſcopal reſidences. The royal palace at Weſtminſter, which had been founded by Edward the Confeſſor, was conſiderably enlarged; and a large hall was built there by William Rufus. The reign of Henry I. was diſtinguiſhed by the foundation and conſtruction of many monaſtic houſes; and ſeveral others were eſtabliſhed during the Anglo-Norman and Plantagenet dynaſties.

A liſt of the religious houſes, with the time of their different foundations, will afford a tolerable idea of the gradual increaſe of the city, with reſpect to ſuch eſtabliſhmeets, and of the difference between ancient and modern London. The town appears to have contained no leſs than fifty-four monaſtic houſes, ſuch as abbies, priories, nunneries, hoſpitals, colleges, &c.

St. Paul's cathedral was firſt founded by Ethelbert, king of Kent; church rebuilt in 961; again in the time of William Rufus. The preſent church commenced in 1675.

The priory of St. Martin-le-Grand, founded by Withred, king of Kent, in the year 700; was given, in 1502, by Henry VII. to Weſtminſter Abbey; the ſtreet of St. Martin-le-Grand is ſtill annexed to Weſtminſter.

The nunnery in Clerkenwell, founded in 1100, by ſir Jordan Briſet.

The hoſpital of St. John of Jeruſalem, in Clerkenwell, was founded in 1100, by the ſame.

The Holy Trinity, or Chriſt-church, within Ald-gate, was founded by the empreſs Maud, in 1108, for Auſtin canons.

The priory of St. Bartholomew in Weſt Smithfield was begun by Rahere, in 1123; the hoſpital ſoon afterwards.

A Benedictine nunnery of Haliwell, by Robert Fitz-Gelran, before 1127.

St. Katherine near the Tower, by the empreſs, before 1148.

The Old Temple of Holborn, in 1118; and the new one near Fleet-ſtreet, by the order, in 1185.

St. Mary Spittle, by Walter Brune, in 1197.

St. Thomas of Acre, in the end of Henry II.'s reign, by Thomas Fitz-Theobald.

The college of Allhallows Barking, by Richard I.

The nunnery of St. Helen's, in Biſhopſgate-ſtreet, was founded by William Fitz-William, in 1210.

The Black Friars had a houſe near Chancery-lane, but afterwards begged or bought the ground near Caſtle Baynard, ſoon after 1221.

The Grey Friars, about 1224; afterwards in Newgate ſtreet.

The White Friars, by ſir Rich Grey, in 1241.

A priory for Auſtin Friars was eſtabliſhed in Broad-ſtreet, by Humphry Bohun, earl of Hereford, in 1253.

The Friars of the Sack, Old Jewry, 1257. Order diſſolved, 1307.

The Croſſed or Crutched Friars, by Ralph Hoſier and William Saberns, in 1298.

The Rolls, or Domus Converſorum, by Henry III. in 1231, for the converſion of Jews.

St. Mary Rouncivall in the Strand, about the ſame period.

The hoſpital or priory of St. Mary of Bethelem or Bedlam, was granted by Simon Fitz-Mary, in 1247.

The convent of St. Clare, in the Minories, by Edmund earl of Lancaſter, in 1293.

A college and hoſpital, called Elſing Spittle, were founded by William Elſing, a citizen, in 1329.

Sir John Pountney founded a college in Cannon-ſtreet, in 1332.

St. Mary of Graces, or Eaſt-Minſter, a Ciſtertian abbey, was founded by king Edward III. in 1350.

The Charter-Houſe, before 1370, by ſir Walter de Manny, and Michael de Northburgh, biſhop of London. See CHARTREUSE.

The hoſpital of the Savoy, in 1505, by Henry VII.

Beſides theſe, the guilds or fraternities of London were very numerous. There was a brotherhood and chapel of the Holy Trinity in Leadenhall, and ſeveral others were founded in moſt churches. The grand ſuppreſſion of the whole commenced in 1537. Excluſive of the religious houſes, the biſhops and parliamentary abbots had each a town reſidence of ſtate.

The abbot of St. Auſtin's, Canterbury, houſe was in the pariſh of St. Olave's, Southwark.

The abbot of Eveſham's, in the pariſh of St. Catherine Cree.

The abbot of Reading's, at Baynard caſtle, in the pariſh of St. Andrew Wardrobe.

The abbot of St. Mary's, York, at St. Peter's Place, Paul's Wharf.

The abbot of Glaſtonbury, in Weſt Smithfield.

The abbot of Hyde, in the pariſh of St. Mary at Hill.

The abbot of Ramſey, in Whitecroſs-ſtreet.

The abbot of Bury St. Edmund's, in St. Mary-ſtreet, Aldgate.

The abbot of St. Alban's, in Lothbury.

The abbot of Peterborough, in the pariſh of St. Gregory.

The abbot of Salop, near St. Bartholomew's, Weſt Smithfield.

The abbot of Leiceſter, in the pariſh of St. Sepulchre.

One inſtance of the ſervice which was rendered to the public, even in London, by the monaſtic inſtitutions, is worthy of note: the priory of St. Mary Spittle contained, at its diſſolution about the year 1536, no leſs than 180 beds for the reception of ſick perſons and travellers. The hoſpitals which were ſuffered to remain, owed their continuance to ſir Richard Greſham, mayor of London, in 1537, who petitioned the king to beſtow the lands belonging to this, St. Bartholomew's, St. Thomas's, and the new abbey on Tower-hill, on the corporation, for the relief and uſe of the poor, the ſick, and the vagrant.

Annals of London, from the Departure of the Romans to the Acceſſion of Edward I.—When the Romans, from the diſtracted ſtate of the empire, found it neceſſary, in the early part of the fifth century, to withdraw their troops from the diſtant provinces, London again became a Britiſh town, and is mentioned in the Saxon chronicle in the year 457, when the Britons fled hither on their defeat by the Saxons under Hengiſt, who, about twenty years afterwards, made himſelf maſter of London; but on his death, in 498, it was retaken by Ambroſius, and retained by the Britons during a conſiderable part of the next century. It afterwards became ſubjected to the newly-eſtabliſhed Saxon kingdom of Eſſex. On the converſion of the Eaſt Saxons to Chriſtianity, London was nominated as the biſhop's ſee, Melitus being appointed the firſt biſhop in the year 604: a cathedral church was erected in 610, on the ſcite of the preſent St. Paul's. During the period of the Saxon heptarchy, but few notices of London appear to have been recorded. In 664 it was ravaged by the plague; and in 764, 798, and 801, it ſuffered ſeverely by fires; in that of 798 it was almoſt wholly conſumed, and great numbers of the inhabitants periſhed. On the union of the Saxon kingdom under Egbert, London, though not the royal reſidence, or ſeat of government, as has been erroneouſly ſtated, was advancing in conſequence, as appears from a Wittenagemot having been held here in 833, to conſult on proper means to repel the Danes. By theſe invaders London was repeatedly pillaged and laid waſte. In 925 king Athelſtan had a palace here; the city increaſed in importance under the Daniſh ſovereigns, and under Edward the Confeſſor; and on the ſucceſsful invaſion of William the Conqueror, the magiſtrates of London, conjointly with the prelates and nobility, invited him to accept the title of king of England. From this period London may be conſidered as the metropolis of the kingdom.

William, at the commencement of his reign, granted a charter to the citizens, which is beautifully written in the Saxon characters, and is ſtill preſerved among the city archives: it conſiſts of only five lines on a ſlip of parchment, ſix inches long and one broad. In the year 1077 the greateſt part of the city was deſtroyed by fire. In the following year the king founded the fortreſs, now called the White Tower, for the purpoſe of keeping the citizens in awe, as he had reaſon to ſuſpect their fidelity. In 1086 another fire conſumed the principal part of the city, together with the church of St. Paul. Maurice, then biſhop of London, laid the foundation of the new church: "a worke," Stow obſerves, "that men of that time judged would never have been finiſhed, it was then ſo wonderful." It is remarkable that Domeſday book, though ſo minute in regard to other cities and towns, does not contain any notice of London. A vineyard is mentioned in Holborn belonging to the crown, and ten acres of land near Biſhopſgate (now the manor of Norton-Falgate) belonging to the dean and chapter of St. Paul's. In November, 1090, above 600 houſes and ſeveral churches were blown down by a tremendous hurricane, and Stow ſays, "the Tower of London was alſo broken." About two years afterwards another deſtructive fire happened. In the ſucceeding years William Rufus repaired the Tower, and ſtrengthened it by additional works; and in 1097 he built a great hall at Weſtminſter. Henry I., as a reward for the ready ſubmiſſion of the Londoners to his uſurped authority, granted to the city an extenſive charter of privileges, among which was the perpetual ſheriffwick of Middleſex. On the death of Henry, the Londoners took a decided part in favour of Stephen in his conteſt with the empreſs, and greatly contributed to his eſtabliſhment on the throne. In the firſt year of his reign a fire, beginning near London Stone, conſumed all the houſes eaſtward to Aldgate, and weſtward to St. Paul's, together with London bridge, which was then of wood. Henry II. does not appear to have held the citizens in any great degree of favour, probably reſenting their attachment to Stephen: and we find that large ſums of money were extorted from them under the ſpecious name of Free-gifts. In 1176 the building of a new bridge of ſtone was commenced at London, but was not completed till the year 1209. On the coronation of Richard I. a dreadful maſſacre of the Jews, who were ſettled in London, was made by the brutal and ignorant populace. At the coronation-dinner, the chief magiſtrate of London, who at that time had the title of bailiff, acted as chief butler. Early in this reign the appellation was changed to that of mayor, in the perſon of Henry Fitz Alwyn. Richard granted the city a new charter, confirming all its liberties, with additional privileges; and four years afterwards, on payment of 1500*l.* he granted another, providing for the removal of all weirs that had been erected on the river Thames; on this charter the corporation of London found their claim to the conſervatorſhip of that noble ſtream. In 1196, a ſedition aroſe in London, headed by William Fitz Oſbert, who excited the common people to oppoſe the government, and gained aſſociates to the amount of 50,000; but the leader being taken and executed, the commotion ſubſided. This is one of the firſt inſtances upon record of a tumultuous aſſemblage in defence of popular rights. In the reign of king John the civic importance of London was greatly increaſed; and its corporation finally aſſumed that form and predominancy, which, with a few alterations, it has maintained till the preſent time. John granted the city ſeveral charters; by one he empowered the "barons of the city of London" to chooſe a mayor annually, or to continue the ſame perſon from year to year, at their own pleaſure. In 1212 a dreadful calamity took place, through a fire which commenced at the bridge end in Southwark, and occaſioned a deſtruction almoſt unparalleled from ſuch a cauſe: Stow relates that about 3000 perſons periſhed. During the conteſt between the king and pope Innocent III. London ſeverely felt the conſequences of the interdict which was laid upon the kingdom. In the civil feuds, which marked the latter years of John, the Londoners ſided with the barons; and when the humbled monarch was compelled to ſign Magna Charta, it was therein expreſsly ſtipulated that the "city of London ſhould have all its ancient privileges and free cuſtoms as well by land as by water." The long reign of Henry III. affords but few events worthy of notice reſpecting London: its growing proſperity was checked by a ſeries of extortions and oppreſſions. In 1258, the price of corn was ſo exceſſive, that a famine enſued, and according to the chronicles of Eveſham, 20,000 perſons died of hunger in London only. In 1264 another maſſacre of the Jews took place; on a plea that one of that perſecuted race had taken more than legal intereſt, and upwards of 500 Jews were put to death by the populace, and their houſes and ſynagogues deſtroyed.

Annals of London from the Acceſſion of Edward I. *to that of Henry* IV.—In the year 1279 all the Jews in England were apprehended in one day, on a charge of their being the authors of the great mutilations which had taken place in the coin during the preceding reign: 280 perſons of both ſexes were executed in London, beſides many others in various parts of the kingdom. Between the years 1314 and 1317 the city, in common with the reſt of the kingdom, ſuffered greatly from a ſcarcity of proviſions, which eventually produced a complete famine. King Edward III., on the commencement of his reign, granted to the city two charters: by the firſt all the ancient privileges were confirmed and additional ones beſtowed; by the other, the village of Southwark was granted to the citizens in perpetuity. In 1348, the terrible peſtilence, which, breaking out in India, ſpread itſelf weſtward through every country on the globe, reached England. Its ravages in London were ſo great, that the common cemeteries were not ſufficiently capacious for the interment of the dead; and various pieces of ground without the walls were aſſigned for burial places: amongſt theſe was the waſte land now forming the precinct of the Charter-houſe, where upwards of 50,000 bodies were then depoſited. This deſtructive diſorder did not entirely ſubſide till 1357. The public entry of Edward the Black Prince into London, May 24, 1356, after the victory he obtained at Poictiers, was celebrated with an unparalleled degree of ſplendour; and every ſtreet through which the cavalcade paſſed, exhibited an extraordinary diſplay of riches and magnificence. The captive king of France, dreſſed in regal robes, was mounted on a white courſer, while the victorious prince rode by his ſide on a ſmall black horſe, and appeared more like an attendant than a conqueror. In 1361, the plague having again broke out in France, every precaution was taken to prevent its ſpreading into England, but without effect; the peſtilence reached London, and its ravages were ſo deſtructive, that upwards of 2000 perſons fell victims in two days. In 1363, a ſumptuous entertainment was given in the city by Henry Picard, alderman, to the kings of England, France, Scotland, and Cyprus, to Edward the Black Prince, and to a great number of nobility and gentry. The year 1378 is memorable in the city annals for the expedition fitted out by an individual, John Philpot, againſt Mercer, the Scottiſh pirate, who taking advantage of the inattention of government to naval affairs, carried off all the ſhipping from the port of Scarborough; and continuing to infeſt the northern coaſt, frequently made conſiderable prizes. The complaints of the merchants were but little regarded by the council; when Philpot prepared a fleet at his own expence, with a thouſand men well armed, went himſelf on board as commander-in-chief, and ſailed in purſuit of the pirate. A long and deſperate engagement enſued; but Philpot obtained the victory, and obliged the pirate to ſurrender, with moſt of his ſhips, among which were fifteen Spaniſh veſſels richly laden. In November 1380, the fourth year of Richard II. an act of parliament was paſſed for levying a poll-tax on every perſon in the kingdom, male or female, above the age of fifteen years. This act was the occaſion of producing, in the following year, one of the moſt dangerous inſurrections that ever threatened the monarchy of this kingdom; and in which the metropolis particularly ſuffered. The tax was exacted with great rigour; and the inſolence of the collectors was an additional cauſe of irritation, and kindled the ſparks of ſedition which ſoon after burſt into an open flame. The inſurrection began in Eſſex, but quickly ſpread through the neighbouring counties, and particularly in Kent, where the daughter of Wat Tyler, ſo called from his trade, having been indecently treated by a collector, the father killed him, and being ſupported by the inſurgents, placed himſelf at their head. To his ſtandard incredible numbers flocked from all parts of the kingdom; and on the 10th of June, 1381, having muſtered on Blackheath a hundred thouſand ſtrong, they entered Southwark, where they ſet at liberty the priſoners from the King's Bench and Marſhalſea priſons, and levelled the houſes of all lawyers. They burnt the archbiſhop's palace at Lambeth, with the rich furniture, books, and regiſters, and deſtroyed the public ſtews which were then tolerated on Bankſide. For one day the bridge gate was ſhut againſt them; but they were afterwards, from prudential motives, admitted into the city. They then proceeded to the palace of the Savoy, which was one of the moſt magnificent ſtructures in the kingdom. Having ſet fire to it in ſeveral places, they cauſed proclamation to be made, that no perſon ſhould convert any part of the rich effects to his own uſe, and actually threw into the fire one of their companions who had reſerved a piece of plate. They alſo burnt the Temple and the other inns of court. Dividing into three parties, one advanced to the rich priory of St. John of Jeruſalem, near Smithfield, which they burned; a ſecond diviſion marched to the Tower, where they ſeized ſir Robert Hales, lord treaſurer, and Simon

Sudbury, archbiſhop of Canterbury, and lord chancellor (though guarded by 1200 ſoldiers), and hurrying them to the adjacent hill, beheaded them; the third diviſion proceeded to Mile End, where the king met them, and promiſed to redreſs their ſuppoſed grievances, on which they diſperſed. But Wat Tyler, with his party, under the pretence of reforming abuſes, continued their ravages in London, liberated the priſoners from the Fleet and Newgate, plundered the houſes of the Lombards who reſided in the ſtreet, which yet retains their name, and dragging the merchants from the churches, whither they had fled for refuge, beheaded them in the ſtreets. Not content with murdering many of the moſt eminent citizens, they made proclamation for beheading all lawyers and perſons connected with the Exchequer, and even all who, in thoſe days of ignorance, were capable of writing. The king made another effort for negociation: attended only by forty horſe, he met Tyler with 20,000 of his adherents in Smithfield. The behaviour of Tyler was ſo inſolent, that the king ordered the mayor, ſir William Walworth, to arreſt him; on his reſiſtance, ſir William felled him to the ground with his ſword, and the attendants diſpatched him. The rebels prepared to revenge their leader's death; but Richard, though only fifteen years of age, with a prudence and bravery which did him more credit than any other action of his life, rode forward, exclaiming, "My friends, will you kill your king? Be not troubled for the loſs of your leader; I will be your captain, and grant what you deſire." They then marched under his direction to St. George's Fields, where, finding a thouſand citizens completely armed to oppoſe them, they threw down their weapons, obtained their pardon, and immediately diſperſed. Thus ended an inſurrection unparalleled in the annals of this kingdom, and which for three weeks ſeemed to threaten a total ſubverſion of the government. In 1390, the king appointed a tournament to be held in London, and ſent heralds to proclaim his intention to all the principal courts of Europe, whence many princes and nobles came to attend the ſpectacle, which was continued with the greateſt ſplendour for four days; open houſe being kept at the king's expence for all perſons of diſtinction. The vaſt expenditure which this and ſimilar feſtivities occaſioned, frequently reduced Richard to great pecuniary difficulties; his enormous profuſion led him to a ſyſtem of oppreſſion and extortion, which eventually cauſed his depoſition and death.

Annals of London from the Acceſſion of Henry IV. *to that of Elizabeth.*—At the coronation of the new king, the mayor, as uſual, officiated as chief butler. The citizens were gratified by the repeal of ſome obnoxious ſtatutes, and an extenſion of their privileges. In 1401, an act was paſſed for "burning obſtinate heretics," entirely aimed at the Lollards, or followers of Wickliffe. The firſt victim was William Santree, pariſh prieſt of St. Oſyth, in Syth-lane, London. In 1407, the Plague again ravaged the kingdom, and ſwept away more than 30,000 of the inhabitants of the metropolis. In 1409, "a great play, of Matter from the Creation of the World," was acted at Skinner's-Well, near Clerkenwell. The exhibition laſted eight days; at which were preſent the king and moſt of the nobility and gentry of the realm. In the following year, John Bradley was condemned as a Wickliffite, and burnt in Smithfield, with circumſtances of peculiar cruelty. In this year Guildhall was erected; the city hall before being a mean cottage in Aldermanbury. The return of king Henry V. after the glorious victory obtained at Agincourt in 1415, was celebrated in London with great magnificence. Neither this reign nor the following produced any events of peculiar import to the city, till the year 1450, when a new inſurrection aroſe, of ſo formidable a nature, that for ſome weeks all the power of the crown was inſufficient to quell it. This tumult is ſuppoſed to have been raiſed by the inſtigation of the duke of York, in order to ſound the inclination of the people, and prepare the nation for his deſign of ſeizing that ſceptre which Henry ſwayed ſo feebly. By the ſecret inſtructions of the duke, Jack Cade, who had ſerved under him in the French wars, aſſumed the name of Mortimer, and collected a ſtrong body of malcontents, under the popular pretext of redreſs of grievances. They entered the city in triumph, and for ſome time bore down all oppoſition; and beheaded the lord treaſurer, lord Say, and ſeveral other perſons of note. The inſurgents at length loſing ground, a general pardon was proclaimed, and Cade, finding himſelf deſerted by his followers, fled: but a reward being offered for his apprehenſion, he was diſcovered, and refuſing to ſurrender, was killed. The remainder of this reign was filled up with the dreadful conteſt between the Lancaſtrians and Yorkiſts, which ended in the depoſition of Henry and the eſtabliſhment of Edward IV. on the throne. The year 1472 will ever be memorable in the annals of the metropolis, for the introduction of printing into this country by William Caxton, citizen and mercer. The hiſtory of the kingdom during this reign and that of Richard III. does not in any particular manner affect the concerns of the city. Soon after the acceſſion of Henry VII. in 1485, an epidemical diſorder of a very ſingular nature, called the *ſweating ſickneſs*, raged with great violence in London. Thoſe attacked by it were thrown into a violent perſpiration, which generally occaſioned their death within twenty-four hours. It appears from Hall's Chronicle, that two mayors and ſix aldermen died of this complaint in one week. This reign was particularly marked by oppreſſion and extortion on the part of the king; and the tumults and inſurrections occaſioned thereby, particularly that in ſupport of Perkin Warbeck, who was aſſerted to be Richard, duke of York, and the heir to the throne. In this event, though highly intereſting to the kingdom, the city was not immediately concerned. In 1500 the kingdom was again viſited by the Plague, of which 30,000 perſons died in the metropolis and its vicinity. In the reign of Henry VIII. when he attempted to raiſe money without the aid of parliament, the citizens made ſuch determined oppoſition to the meaſure, and their example had ſuch an influence through the kingdom, that the king, in full council, abandoned his deſign, and granted a pardon to all who had oppoſed him. On the king's marriage with Anne Boleyn, in 1533, ſhe was conveyed from Greenwich to the Tower, and thence through the city to Weſtminſter, with all the magnificence and pageantry which unbounded prodigality could deviſe. The remainder of this reign was notorious for the tyranny and cruelty of the king, who, having thrown off the pope's ſupremacy, ſacrificed all who adhered to it: yet profeſſing a zealous attachment to the doctrines of the church of Rome, he put to death thoſe perſons who preſumed to differ from him. Hence the promoters of reformation, and its oppoſers, periſhed in the ſame flames; the blood of the Catholic and Proteſtant was ſhed upon the ſame block; and Henry, whilſt vehemently contending againſt the pope's infallibility, ſupported his own with the moſt vindictive cruelty. In theſe ſanguinary ſcenes, London had its full ſhare; great numbers, of all ranks, were continually executed, either for hereſy or treaſon. The ſuppreſſion of the monaſteries now took place: oppoſition to the king's will was fatal; and the partial inſurrections which broke out in conſequence, only ſerved to forward his meaſures, by giving the colour of neceſſity to the vengeance that was inflicted. Many improvements were made during this reign in the city and its ſuburbs. The police was better regulated; nuiſances were removed; the ſtreets and avenues were amended and paved; and various regulations were carried into effect for ſupplying the metropolis with proviſions, to anſwer the demands of an increaſing population. In the ſhort reign of Edward VI. the reformation proceeded with ſteadineſs and regularity: but on the acceſſion of Mary the church of Rome again gained the aſcendency. On the projected union between the queen and the king of Spain, a formidable inſurrection enſued, in which the city was particularly affected: the ſuppreſſion of this revolt was followed by a dreadful ſcene of ſanguinary triumph. The ſtatutes againſt heretics were now alſo enforced with great ſeverity. A number of perſons were burnt in Smithfield: in the whole kingdom upwards of 200 were brought to the ſtake.

Annals of London from the Acceſſion of Elizabeth to the Revolution in 1688.—Elizabeth ſucceeded her ſiſter amidſt the acclamations of all ranks of people. Reformation again reared its head, and was in a ſhort time firmly eſtabliſhed. In 1561 the ſpire of St. Paul's cathedral was ſtruck by lightning, and great part of the building conſumed. In 1563 the Plague again made dreadful ravages, to which 20,000 perſons fell victims in the city. In July 1566, the foundations of the Royal Exchange were laid by ſir Thomas Greſham, and the ſtructure was completed in the following year. The year 1569 exhibited a novelty in London of moſt pernicious example. The firſt public lottery was then drawn at the weſt door of St. Paul's cathedral, and the drawing continued, without interruption, from January 11 to May 6. The prizes were of plate, and the profits were appropriated to the repair of the ſea-ports. In 1586 a conſpiracy was ſet on foot to aſſaſſinate Elizabeth, and free the queen of Scots from the captivity in which ſhe had paſſed almoſt eighteen years. The plot was ſoon diſcovered, and the conſpirators, fourteen in number, were executed in Lincoln's-inn-Fields. Mary was ſaid to be implicated in the conſpiracy; and this, whether true or falſe, furniſhed a plauſible pretext for thoſe proceedings, which ſoon after condemned her to the block. The ſentence againſt her was proclaimed with great ſolemnity at different places in London and Weſtminſter. In the preparations made to repel the threatened attack of the boaſted Spaniſh Armada, London took a moſt diſtinguiſhed ſhare, in furniſhing large ſupplies of money, men, and ſhips. The preparations for the coronation of king James were interrupted by a dreadful Plague, which ravaged the city with greater violence than any ſimilar viſitation ſince the time of Edward III. In 1604, the horrible conſpiracy, known in hiſtory by the name of the "Gunpowder Plot," the grand object of which was to prepare the way for the reſtoration of the Catholic religion, was commenced by its daring contrivers, with every poſſible precaution that ſeemed neceſſary to enſure its ſucceſs. The deſtruction of the king and parliament was the preliminary meaſure through which the conſpirators thought to accompliſh their deſign; and the blowing up of the parliament-houſe with gunpowder at the moment when the ſovereign ſhould be commencing the buſineſs of the ſeſſion by the accuſtomed ſpeech from the throne, was the dreadful means by which the deſtruction was intended to be accompliſhed. All the principal conſpirators were bigotted Catholics, who had for many years been plotting the downfall of Proteſtantiſm in this country, and had even applied for aid to Spain and Flanders. Being diſappointed of the aſſiſtance they required, they reſolved to depend on their own efforts, and about Eaſter 1604, formed the idea of the gunpowder plot, to be carried into effect on the meeting of parliament in February following. Accordingly Percy, one of the conſpirators, hired a houſe immediately adjoining to the houſe of lords, and the operations commenced by digging through the foundation-wall, which was nine feet in thickneſs. Juſt at this juncture, a vault under the parliament-houſe, uſed as a depoſitory for coals, was to be let, and the coals to be ſold. As nothing could have happened more favourable for their purpoſe, Percy hired the cellar, and bought the coals, as if for domeſtic uſe, and without any appearance of concealment. The prorogation of parliament from February to October gave the conſpirators ſufficient leiſure to further their deſign; and, at convenient opportunities, thirty barrels and four hogſheads of gunpowder, which had been procured from Holland, were conveyed into the cellar by night, and covered with billets, faggots, iron-bars, and ſtones. This was done without exciting any ſuſpicion: parliament had again been prorogued to November 5th; and the conſpiracy wore every aſpect of ſucceſs. It had now been on foot eighteen months, and confided to more than twenty perſons; yet nothing had led a ſingle ſtep towards diſcovery; when the plan was happily fruſtrated by a circumſtance apparently trivial. One of the conſpirators, wiſhing to ſave lord Monteagle, ſent him a letter, adviſing him, in ambiguous terms, to abſent himſelf from parliament, on account of a ſudden danger to which he would be expoſed. This notice Monteagle carried to the ſecretary of ſtate, who laid it before the privy-council. A ſecret ſearch was determined on, but, to prevent ſuſpicion, was delayed till the eve of the meeting of parliament, and then made only by the lord chamberlain, as if in a formal diſcharge of his office. When he entered the cellar, and ſaw the great ſtore of coals and wood, he enquired to whom it belonged, and was informed the cellar was let to Mr. Percy, and the fuel was for his conſumption. The chamberlain heard this with ſeeming careleſsneſs, and left the cellar with apparent negligence. But at midnight a further ſearch was made; Guy Fawkes, a principal conſpirator, to whom the final execution of the plot was aſſigned, was apprehended in the cellar: the fuel was removed, and the gunpowder diſcovered. Fawkes gloried in the plot, but refuſed to diſcover his accomplices; the ſight of the rack, however, ſubdued him, and he made a full diſcloſure of the whole conſpiracy. His aſſociates fled into Warwickſhire, where they endeavoured to excite a riſing of the Catholics, but without effect. A proper force was ſent againt them, four were killed in reſiſtance, and the reſt were taken and brought to London, where, with Fawkes, they ſuffered the juſt puniſhment of their guilt. In the year 1609, the city acquired a conſiderable acceſſion of power and property: almoſt the whole province of Ulſter, in Ireland, having fallen to the crown, the king made an offer of the eſcheated lands to the city, on condition they would eſtabliſh an Engliſh colony there. The propoſal was accepted; and ſo rapid was the colonization forwarded, that within ſeven years aroſe the two capital towns of Londonderry and Coleraine. The commencement of Charles I.'s reign was marked by the return of the plague, which carried off in the metropolis 35,000 perſons. To advert to all the important tranſactions that took place in London during the eventful ſtruggle between Charles and his people would far exceed our limits. The exceſſive oppreſſions to which the nation was ſubjected, were more particularly felt in the metropolis than in other parts of the kingdom, from its being more directly within the vortex of the ſtar-chamber and high-commiſſion courts, and from the effects of the monopolies, which had a moſt pernicious influence on trade and commerce. For the particulars of this important period, we refer our readers to Clarendon's Hiſtory of the Great Rebellion.

The year 1665 became memorable in London by the dreadful ravages of the great Plague, which firſt made its appearance in December 1664, and had not entirely ceaſed till January 1666. Its progreſs, the firſt two or three months, was comparatively ſmall, but continued to advance, notwithſtanding every precaution was uſed to abate its fury: from May to October 1665, it raged with the greateſt violence; the deaths progreſſively increaſed from five hundred to eight thouſand weekly. The peſtilence was now at its height: its ravages, which commenced in Weſtminſter and the weſtern ſuburbs, extended through the city to Southwark, and to all the pariſhes eaſtward of the Tower. The digging of ſingle graves had long been diſcontinued, and large pits had been excavated, in which the dead were depoſited with ſome little regularity and decent attention: but now all regard to ceremony became impoſſible. Deeper and more extenſive pits were dug, and the rich and the poor, the young and the aged, the adult and the infant, were all promiſcuouſly thrown together into one common receptacle. Whole families, and even whole ſtreets of families, were ſwept away together. By day, the ſtreets preſented a moſt frightful aſpect of deſolation and miſery; and at night the dead carts, moving with ſlow pace by torch-light, and with the appalling cry, "Bring out your Dead," thrilled horror through every heart that was not by ſuffering hardened to calamity. The ſtoppage of public buſineſs was ſo complete, that graſs grew within the area of the Royal Exchange, and even in the principal ſtreets of the city: all the inns of court were ſhut up, and all law proceedings ſuſpended. The entire number returned in the bills of mortality, as having died of the plague within the year, was 68,950; yet there can be no doubt that this total fell ſhort, by many thouſands, of thoſe who actually fell by the infection, but whoſe deaths were not officially recorded. The aggregate is eſtimated at about 100,000. The whole number of deaths within that year, as given in the bills, was 97,306. Since this dreadful period, the plague has entirely ceaſed in London: a circumſtance that muſt be regarded as the more remarkable, when it is conſidered how frequent had been its ravages for ages paſt, and when reference is had to the bills of mortality for the preceding part of this very century, when ſcarcely a year paſſed without ſome perſons falling victims to the infection. For further particulars, ſee Plague.

The moſt important event that ever happened in this metropolis, whether it be conſidered in reference to its immediate effects, or to its remote conſequences, was the great Fire, which broke out in the morning of Sunday, September 2, 1666, and, being impelled by ſtrong winds, raged with irreſiſtible fury nearly four days and nights, nor was it entirely maſtered till the fifth morning. The deſtructive extent of this conflagration was, perhaps, never exceeded in any part of the world, by any fire originating in accident. Within the walls it conſumed almoſt five-ſixths of the whole city; and without the walls, it cleared a ſpace nearly as extenſive as the one-ſixth part left unburnt within. Scarcely a ſingle building, that came within the range of the flames, was left ſtanding. Public buildings, churches, and dwelling-houſes were alike involved in one common fate; and, making a proper allowance for irregularities, it may fairly be ſtated, that the fire extended its ravages over a ſpace of ground equal to an oblong ſquare, meaſuring upwards of a mile in length, and half a mile in breadth. In the ſummary account of this vaſt devaſtation given in one of the inſcriptions on the monument, and which was drawn up from the reports of the ſurveyors appointed after the fire, it is ſtated, that "the ruins of the city were 436 acres, *viz.* 373 acres within the walls, and 63 in the liberties of the city; that of the ſix-and-twenty wards it utterly deſtroyed fifteen, and left eight others ſhattered and half burnt; and that it conſumed 400 ſtreets, 13,200 dwelling-houſes, 89 churches, beſides chapels; four of the city gates, Guildhall, many public ſtructures, hoſpitals, ſchools, libraries, and a vaſt number of ſtately edifices." The immenſe property deſtroyed in this dreadful conflagration could never be calculated with any tolerable degree of exactneſs; but according to the beſt eſtimations that have been made, the total value muſt have amounted to the immenſe ſum of ten millions of pounds ſterling. As ſoon as the general conſternation had ſubſided, the rebuilding of the city became the firſt object of conſideration; an act of parliament was paſſed for that purpoſe; and though all was not done that might have been, the city was principally rebuilt within little more than four years, and that in a ſtyle of far greater expence and regularity, and infinitely more commodious and healthful, than the ancient capital. In the ſyſtem of tyranny and oppreſſion which marked the reign of Charles II. the city largely participated; having its ancient liberties and privileges invaded, and magiſtrates arbitrarily forced on the citizen at the pleaſure of the king. Every principle of law and juſtice was violated; and in this humiliating ſtate London continued till the revolution.

Annals of London from the Revolution in 1688, *to the preſent Time.*—In the firſt year of William and Mary, an act was paſſed, by which all proceedings of former reigns againſt the city charters were reverſed, and all the rights and privileges of the citizens were fully re-eſtabliſhed. In 1692, during the king's abſence in Holland, the queen borrowed 200,000*l.* of the city for the exigencies of government. In 1694, an infamous ſyſtem of bribery was inveſtigated by the houſe of commons, when it was proved, that a thouſand guineas had been demanded and taken from the chamberlain of London by ſir John Trevor the ſpeaker, for forwarding the Orphan bill; in conſequence of which he was expelled the houſe. In 1697, an act of parliament was paſſed for the ſuppreſſion of the much abuſed privilege of ſanctuary, heretofore attached to the following places, *viz.* the ſanctuary in the Minories, Saliſbury-court, White-friars, Ram-alley, and Mitre-court in Fleet-ſtreet; Fulwoods-rents in Holborn; Baldwin's-gardens in Gray's-inn-lane; the Savoy in the Strand; and Montague-cloſe, Deadman's-place, the Clink, and the Mint, in Southwark. The year 1703 was remarkable for a dreadful ſtorm of wind, which raged through the night of the 26th of November. The damage ſuſtained by the city alone was eſtimated at two millions ſterling; and in the ſuburbs the damage was proportionably great: the lead on the tops of ſeveral churches was rolled up like ſkins of parchment; and at Weſtminſter-abbey, Chriſt's-hoſpital, St. Andrew's Holborn, and many other places, it was carried off from the buildings. The ſhips in the river were driven from their moorings; four hundred wherries were loſt; more than ſixty barges were driven foul of London-bridge, and as many more were ſunk or ſtaved above the bridge. At ſea the deſtruction was immenſe; twelve men of war, with more than eighteen hundred men on board, were loſt within ſight of their own ſhore. The year 1709 was marked by a circumſtance highly creditable to the humanity of the nation. The cruel depredations of the French in the palatinate compelled the inhabitants to deſert their country; twelve thouſand, in the moſt forlorn condition, ſought refuge in London: the queen, for ſome time, ſupported them out of her privy purſe; ſhe was afterwards aſſiſted by the benevolence of her ſubjects, and 22,038*l.* was paid into the chamber of the city for the relief of theſe diſtreſſed fugitives, who were finally diſpoſed of as coloniſts to Ireland and North America.

The increaſe in the population of the metropolis having occaſioned a great inſufficiency in places for divine worſhip, an act of parliament was paſſed in 1711 for erecting fifty new churches in and about London: the expence of which was defrayed by a ſmall duty on coals brought into the port of London for about eight years. The year 1720 will ever be famous in the annals of London, from the deſtructive ſyſtem of ſpeculation and fraud which hiſtory has denominated the South Sea bubble; and which ſo completely infatuated the people, that they became the dupes of the moſt barefaced impoſitions. (See Bubble, in *Commerce*.) The directors of the South Sea Company, encouraged by the prevalent ſpirit of avaricious enterpriſe, propoſed to the government to take into their fund all the debts of the nation, under the plauſible pretext of a ſpeedier redemption. The amount of the debts was 31,664,551*l.*; for the liberty of adding the whole of which to their capital ſtock, they offered to pay to the public the immenſe ſum of 7,723,809*l.* This bait was too tempting to be refuſed; the plan received the ſanction of parliament, and the directors were empowered to raiſe the ready money neceſſary for ſo great an undertaking, "by opening books of ſubſcription, and granting annuities to ſuch public creditors as were willing to exchange the ſecurity of the crown for that of the South Sea Company, with the advantage of ſharing in the emoluments that might ariſe from their commerce." So much was the public mind impreſſed with the idea of rapid gain, that before the act received the royal aſſent, the company's ſtock roſe to 319*l. per cent.*: it advanced ſo amazingly for three months, that books were then opened for a freſh ſubſcription of four millions at 1000 *per cent.*; and ſuch was the popular frenzy, that within a fortnight the new ſubſcription was at 200 *per cent.* premium. Some alarm now prevailed: it had been whiſpered, that the directors and their friends had diſpoſed of their own ſtock while the price was at the higheſt; and all confidence in the ſtability of their credit was deſtroyed. The confuſion became general; every one was willing to ſell, but no purchaſers could be found, except at a vaſt reduction. Diſtraction and diſmay ſpread through the city; the ſtock fell rapidly, and, before the end of the year, was reduced to 86 *per cent.* which was about its real value. The deſtruction to public and private credit, thus produced, was exceſſive: all trade was at a ſtand; and many of the moſt reſpectable merchants, goldſmiths, and bankers of London, who had unwiſely lent large ſums to the company, were obliged to abſcond. A parliamentary inveſtigation enſued; and the knavery of the directors was ſo apparent, that the greater part of their eſtates was confiſcated for the benefit of thoſe whom their villainy had ruined. The ſum thus obtained amounted to 2,014,000*l.*

During the continuance of the infatuation which the South Sea deluſion inſpired into all claſſes of people, many other viſionary projects were ſet on foot by ſpeculators and gamblers; even chartered companies of eſtabliſhed credit lent their countenance to ſchemes of impoſſible accompliſhment: nearly two hundred ſubſcription projects were afloat at one time. When the public confidence in the South Sea ſcheme was on the decline, the ſuperior ſtability of the bank of England, Eaſt India, and African companies, was at once ſeen: Bank ſtock roſe from 100 to 260; Eaſt India ſtock from 100 to 405; and African ſtock from 100 to 200. The ſhares in the London and Royal Exchange Aſſurance Companies alſo experienced a prodigious riſe. See Insurance.

The cloſe of the year 1729 was attended by a great mortality in London; the deaths within the bills of mortality in the courſe of the year amounting to almoſt 30,000. The pernicious habit of dram-drinking had become ſo general, and ſo many diſorders had been occaſioned, and crimes commited in conſequence of it, that in the year 1736 the legiſlature found it neceſſary to prohibit the ſelling of Geneva, except under certain reſtrictions. Previous to this, the magiſtrates had aſcertained that the number of gin-ſhops in London and Weſtminſter was 7044, beſides garrets and cellars where the baneful liquor was ſold privately. So determined were the retailers to carry on their trade, that the utmoſt exertions of the police were required to enforce the act; and within two years, 12,000 perſons were convicted and fined under its proviſions.

The winter of 1739—40 was memorable from the occurrence of one of the moſt intenſe froſts ever known in this country, and which is recorded in our annals by the appellation of the Great Froſt; it commenced on Chriſtmas-day, and laſted till the 17th of February: above bridge the Thames was completely frozen over, and numerous booths were erected on it for ſelling liquors, &c. to the multitudes who daily flocked thither. Great improvements were now made in different parts of the metropolis; and convenience, health, and ſafety, were more generally attended to than they had previouſly been. Weſtminſter bridge was finiſhed and opened for public uſe in the year 1750; the houſes upon London bridge were pulled down in 1756; and in the two ſucceeding years the bridge was put into a courſe of repair. In 1760 Black-friars' bridge was commenced; moſt of the city gates were taken down; and an act of parliament was obtained for making alterations in the avenues of the city and its liberties; ſome of which have been carried into effect at different periods, yet many others remain to be executed. In the year 1763, the recent peace with France, the reſignation of Mr. Pitt, afterwards earl of Chatham, as premier, and other political occurrences, ſet the metropolis into a complete ferment. The conduct of adminiſtration was ſuch, as to augment rather than obviate the prevailing diſcontents. Hence the miniſtry were aſſailed with political publications; in particular by a periodical paper called "The North Briton;" the writers of which, the principal of whom was John Wilkes, were determined to expoſe the meaſures of the then adminiſtration to the contempt they deſerved. The forty-fifth number of this paper contained ſuch ſevere reflections on the king's ſpeech to parliament, that the miniſtry thought they had an opportunity to cruſh their avowed enemy. Mr. Wilkes was apprehended and committed to the Tower under an illegal warrant, ſigned by the principal ſecretary of ſtate; but the caſe being argued in the court of Common Pleas, before lord chief juſtice Pratt, the court directed him to be diſcharged. Mr. Wilkes brought actions againſt the earl of Halifax, ſecretary of ſtate, for iſſuing the warrant, and againſt Mr. Wood, under-ſecretary, and obtained verdicts with damages; 4000*l.* from the former, and 1000*l.* from the latter. Shortly after his releaſe, Mr. Wilkes eſtabliſhed a printing-preſs in his own houſe, and republiſhed all the numbers of the obnoxious paper. This provoked the miniſtry ſo highly, that an information was filed againſt him. The "North Briton, No. 45," was voted by the houſe of commons to be a ſeditious libel, and ordered to be burnt by the common hangman. Mr. Wilkes was expelled the houſe;

and though he retired to France, his trial was brought on in his abſence, when he was found guilty of republiſhing the libel, and was conſequently outlawed. Four years afterwards he returned to England, his outlawry was reverſed, and he was ſentenced to two years impriſonment; during which he was elected an alderman of London, and knight of the ſhire for Middleſex.

In the year 1780, from a cauſe apparently harmleſs, a petition to parliament from the Proteſtant Aſſociation, aroſe an inſurrection, compoſed chiefly of the loweſt of the people, which for a week bore the moſt alarming appearance; the priſons of Newgate, the King's Bench, and the Fleet were burnt and the priſoners ſet at liberty, and moſt of them joined the inſurgents. The Popiſh chapels, and a great number of private houſes of Catholics, were ſet on fire: and thirty ſix fires were ſeen blazing at one time in various parts of the metropolis. Military interference became abſolutely neceſſary, when many of the rioters were killed; 135 were brought to trial, of whom 59 were convicted, and upwards of 20 of the moſt active were executed in various parts of the town, but immediately contiguous to the ſcenes of their reſpective depredations.

During the year 1792, and the two following years, the metropolis was greatly agitated by political contention; many aſſociations were formed for the purpoſe of obtaining a more pure and equal repreſentation of the people. The two principal of theſe aſſociations, *viz.* the Friends of the People, and the Correſponding Society, held their meetings in London. Their avowed object was parliamentary reform; but they were ſtigmatized by their enemies with the appellations of Republicans and Levellers. Some of the moſt active and powerful leaders of theſe aſſociations were at length arreſted, and tried for high treaſon, but after a long inveſtigation all were acquitted. Other perſons, among whom was Thomas Paine, were proſecuted for ſedition, and ſome were impriſoned. Paine was pronounced guilty of writing and publiſhing the ſecond part of the Rights of Man, which was declared ſeditious, and the author having left the kingdom, was outlawed. The numerous clubs, debating ſocieties, and political aſſociations formed in the metropolis ſoon after the revolution in France, and during the early ſtages of the war againſt that country, conſtitute a prominent epoch in the hiſtory of the metropolis. The country was hurried on to the very brink of revolution; but this great criſis was prevented by the vigilant, powerful, and determined conduct of the Pitt adminiſtration. An Alien act was paſſed in 1793, the Habeas Corpus act was ſuſpended in the next year; and various arbitrary and oppreſſive meaſures were adopted by the miniſtry to preſerve public tranquillity, but at the ſame time abridge the rights of the Britiſh ſubjects.

The year 1797 was diſtinguiſhed by the ſtoppage of bank payments in ſpecie, as the government had employed nearly all the current coin in remittances to the emperor of Germany and to other foreign powers. An act of parliament was now paſſed to allow the bank to iſſue notes under five pounds. At the commencement of 1798 a numerous meeting of the bankers, merchants, and traders of London, was held in the Royal Exchange for the purpoſe of raiſing a voluntary ſubſcription for the public ſervice. In the courſe of four days the common council alone ſubſcribed 10,000*l.*, 200,000*l.* was ſubſcribed by the bank, conſiderable ſums were given by other public companies, and 20,000*l.* was advanced by his majeſty. The miniſter eſtimated this ſubſcription at one million and a half, but the total amount was more than two millions of money. Continued threats of invaſion from France induced the miniſter to adopt ſome new mode of defence; and ſeveral armed aſſociations were formed by different pariſhes and companies in the metropolis. On the 4th of June, 1799, all theſe volunteers were aſſembled in Hyde Park, and reviewed by his majeſty, the princes, &c. The total number under arms was 8989, of which 1008 were cavalry. On the 21ſt of the ſame month, a ſtill greater number of volunteers was diſperſed through the ſtreets, ſquares, and ſuburbs of the metropolis, to be inſpected again by the king, and a numerous retinue of princes, dukes, &c. It is ſtated, that 12,208 volunteers were then drawn out under arms. A ſimilar review of the volunteers to the former, took place on the 4th of June 1800. On the ratification of preliminaries of peace in October, 1801, the metropolis was brilliantly illuminated, and all claſſes of people teſtified great joy at the event. The definitive treaty was ſigned on the 27th of the following month, and the illuminations throughout London were now ſingularly ſplendid and general. A war again broke out, and an act of parliament was paſſed to enable his majeſty to arm the people *en maſſe*. Other acts for increaſing the military force of the country were alſo paſſed. The cities of London and Weſtminſter, and pariſhes immediately adjacent, raiſed a volunteer force amounting to 27,077 men. A patriotic fund was eſtabliſhed in London in July 1803, and before the end of Auguſt more than 152,000*l.* were ſubſcribed; towards which the city, in its corporate capacity, gave 2500*l.* The ſucceſſive deaths of lord Nelſon, Mr. Pitt, and Mr. Fox, produced great ſenſation in the metropolis, and many changes in the legiſlative officers. Covent Garden theatre and ſeveral contiguous houſes were conſumed by fire in September 1808; another fire in January 1809, deſtroyed part of the king's palace at St. James's, and a third fire, in February of the ſame year, conſumed the whole of Drury-lane theatre. The October of 1809 is memorable in the annals of London, for the circumſtance of his majeſty's entrance into the fiftieth year of his reign, and the loyal rejoicings, or public manifeſtations of loyalty that were diſplayed on the occaſion. The memorable and unpropitious expedition to Walcheren, the theatrical riots at Covent Garden theatre, the inveſtigation, before the houſe of commons, relating to the duke of York and a noted proſtitute of the name of Clarke, the arreſt and impriſonment of ſir Francis Burdett, a member of the houſe of commons, are all memorable events in the local hiſtory of London, and are entitled to particular narration and expoſition in a publication devoted to the topography of the metropolis. In Brayley's Survey, already referred to, theſe ſubjects are particularized and elucidated. It is conjectured that within the laſt forty years, 40,000 new houſes at leaſt have been erected in London and its connected environs, and that theſe afford habitation for nearly 200,000 new inhabitants. In July, 1794, a fire broke out in Radcliffe highway, and conſumed 630 houſes, with much other property. Many of the inhabitants fixed tents in the open fields, where they lived for ſeveral weeks till new houſes were erected.

Hiſtory of the Commerce of London.—

> "Then COMMERCE brought into the public walk
> The buſy Merchant; the big Warehouſe built;
> Rais'd the ſtrong Crane; choak'd up the loaded Street
> With foreign Plenty; and thy Stream, O Thames,
> Large, gentle, deep, majeſtic king of floods!
> Choſe for his grand reſort." Thomſon.

London is univerſally acknowledged to be the firſt commercial, as well as the firſt manufacturing city in the world. Conſidering, therefore, the intimate connection that ſubſiſts between its trading proſperity and the general intereſts of the empire; the ſubject of this ſection cannot fail to be highly intereſting and important. To trace the ſteps by which London has riſen to its preſent opulence and grandeur, is in fact to develope the ſources of that diſtinguiſhed rank which England now holds among the nations of the earth.

London was, doubtleſs, a place of conſiderable trade at a very early period. Tacitus ſpeaks of it as the *nobile emporium* of his time; the great reſort of merchants, and though not a colony, famous for its commercial intercourſe. After this, little is known of it, in reſpect to trade, until the cloſe of the ſecond century of the Chriſtian era, when it is again mentioned as having become “a great and wealthy city.” In the year 359, it is ſaid of England, that its “commerce was ſo extended, that 800 veſſels were employed in the port of London for exportation of corn only.” Three centuries afterwards Bede ſtyles it “an emporium for many nations repairing to it by land and ſea.” Fitz-Stephen, who lived in the reign of Henry II. ſays, that “no city in the world exports its merchandize to ſuch a diſtance as London;” but does not inform us what goods were exported, or to what countries they were carried. Among the imports, however, he enumerates gold, ſpices, and frankincenſe from Arabia; precious ſtones from India; and palm-oil from Bagdad. But it ſeems more reaſonable to ſuppoſe theſe were obtained through the medium of the trading cities of Italy, than by direct commerce to the reſpective places. William of Malmſbury, who likewiſe lived about this period, calls “London a noble city, renowned for the opulence of its citizens,” and “filled with merchandize brought by the merchants of all countries.” The ſame author adds, “that in caſe of ſcarcity of corn in other parts of England, it is a granary, where it may be bought cheaper than any where elſe.” Thus it will be perceived, that even in the infancy of European commerce, and at a time when ignorance and barbariſm clouded almoſt every portion of the world, this city had made no inconſiderable progreſs towards its preſent celebrity and importance.

In the year 1220, the merchants of Cologne, in Germany, probably in conſequence of an invitation from king John in 1203, eſtabliſhed a hall or factory in London, which ſhortly after became the general factory of all the German merchants reſident in the city. Not long ſubſequent to this period, *viz.* in 1245, ſea coal “carbone maris,” is mentioned among the articles of inquiſition into treſpaſſes committed in the king's foreſts. Hence it may reaſonably be inferred, that coal was not only known and wrought before this time, but actually formed a part of the imports of London. Sea-coal lane, in this city, was certainly ſo named as early as the year 1253, and according to Stow, received this appellation from lime being burnt there with ſea-coal.

The cloſe of the thirteenth century appears to have been a remarkable era in the commercial hiſtory of London. In 1296, the company of merchant-adventurers was firſt incorporated by Edward I. The Hanſards, or Hanſe merchants, alſo received conſiderable privileges about the ſame time. In the year 1498, when all direct commerce with the Netherlands was ſuſpended, this body obtained very great advantages over the merchant adventurers by importation of vaſt quantities of thoſe articles, through the medium of the Hanſe towns, which before had come directly from the Netherlands, where the trade of the latter company had been chiefly eſtabliſhed. In conſequence of theſe circumſtances, the warehouſes of the merchants were attacked and rifled by the mob; but the offenders were ſoon ſuppreſſed, and many of them puniſhed.

In the year 1504, all the ancient privileges of the Hanſe, or as they were likewiſe called, Steel-yard merchants, were confirmed to them by ſtatute, and all the previous acts which had been made in derogation of them were annulled. A ſimilar charter was alſo obtained by the Engliſh merchants “trading in woollen cloths of all kinds to the Netherlands,” in which they are for the firſt time ſtyled the “Fellowſhip of merchant-adventurers of England.” This act ſtrictly prohibited the Steel-yard aſſociation from interfering with their trade, by carrying cloths to any of their ſettlements in the Low Countries. Notwithſtanding theſe unfavourable clauſes, however, the Hanſe-merchants ſeem to have engroſſed the chief trade of the city. Grievous accuſations were conſequently made againſt them, for their proceedings were conſidered as tending to ruin the commerce of the native Engliſh. The city of London at length inſtituted an action, in the Star-chamber, againſt them, the object of which was to deprive them of their privileges as a body. Accordingly, in the year 1597, a decree was obtained, annulling their aſſociation, and ordering them, under ſevere penalties, to quit the kingdom. See HANSE *Towns*.

But to return: it may be proper to remark, that during the contentions between the houſes of York and Lancaſter, the commerce of London was very conſiderably retarded. In the reign of Henry VII. it again began to make rapid progreſs. Still, however, if credit is to be given to Wheeler's “Treatiſe on Commerce,” publiſhed in 1601, the trade of this city muſt have been very low indeed, even as late as the year 1539; for that author expreſsly avers, that ſixty years before he wrote, there were not above four merchant veſſels exceeding 120 tons burthen in the river Thames. Nor would it appear that they had increaſed much in the next reign, if we are to believe the report of a London merchant, who, in a letter to ſir William Cecil ſays, that there is not a city in Europe “having the occupying that London hath, ſo ſlenderly provided with ſhips.”

Notwithſtanding theſe complaints, however, it is undoubtedly a fact, that a ſpirit of enterpriſe was very general among the merchants about this period. For, in 1553, we find a great geographical and mercantile diſcovery made by a company, conſiſting of 240 ſhareholders, inſtituted for the purpoſe of proſecuting diſcoveries under the direction of Sebaſtian Cabot, a merchant of Briſtol. (See CABOT, SEBASTIAN.) This aſſociation having fitted out three ſhips, one of them accidentally fell into the bay of St. Nicholas, in the White ſeas, and landing at Archangel, obtained from the czar of Ruſſia peculiar privileges of trade with the ſubjects of his dominions. Within a few years after, the London merchants had alſo factors ſettled at the Canaries. The Ruſſia or Muſcovy merchants were incorporated in the reign of Philip and Mary, and had their charter ſubſequently confirmed by Elizabeth, in her eighth year. This princeſs, likewiſe, obtained an excluſive grant to the Engliſh of the whole foreign commerce of that extenſive empire, which they continued to enjoy for a conſiderable period. About this time the civil diſſentions in Flanders began, upon which a vaſt number of families from the Netherlands flocked to London, and brought over with them their trade and riches. This great addition to the population of the city, and the conſequent increaſe of its commerce ſoon after, led to the erection of the Royal Exchange, by the celebrated ſir Thomas Greſham, in the years 1566 and 1567. (See ROYAL *Exchange*.) Previous to this the merchants were accuſtomed to meet twice every day in Lombard-ſtreet, without any other refuge from the ſeverities of the weather but what the neighbouring ſhops might occaſionally afford. In 1579, the Levant, or Turkey Company, was eſtabliſhed, as was alſo the Eaſtland Company; both of which ſtill exiſt, but the former only retains any degree of importance. On the

31ſt of December, 1600, the queen granted the firſt patent to the Eaſt India Company. Their ſtock then amounted to 72.000*l.* and with this ſum the company was enabled to fit out four ſhips under the command of James Lancaſter. The adventure proving ſucceſsful, the company continued its exertions, and hence has ariſen the moſt ſplendid and powerful mercantile aſſociation that probably ever exiſted in the world. (See Company, *Eaſt India.*) Aſſurance and inſurance companies were now eſtabliſhed in London. An act was paſſed in 1601 for regulating the buſineſs of aſſurance, and a ſtanding commiſſion of merchants appointed to meet weekly "at the office of inſurance on the weſt ſide of the Royal Exchange." (See Insurance *Companies.*) The company of Spaniſh merchants were likewiſe among the number of thoſe incorporated by Elizabeth, ſo that the reign of that princeſs may be juſtly ſaid to form a grand era in the commercial hiſtory of this metropolis.

In the reign of James I. the progreſs of the foreign trade was rapidly increaſed. Tobacco, which had firſt been introduced in 1565, now became a conſiderable article of import. (See Tobacco.) The tonnage and number of the ſhipping in the port of London were greatly augmented about this time. Many of the patents granted by Elizabeth were annulled, and the trade thrown open. Howe, ſpeaking of the foreign commerce of this city in the year 1614, ſays, "London, at this day, is one of the beſt governed, moſt richeſt, and flouriſhing cities in Europe; plenteouſly abounding in free trade and commerce with all nations; richly ſtored with gold, ſilver, pearl, ſpice, pepper, and many other *ſtrange* commodities from both Indies; oyles from Candy, Cyprus, and other places under the Turk's dominion; ſtrong wines, ſweet fruits, ſugar, and ſpice, from Grecia, Venice, Spayne, Barbaria, the iſlands and other places lately diſcovered and known; drugs from Egypt, Arabia, India, and divers other places; ſilks from Perſia, Spayne, China, Italy, &c.; fine linen from Germany, Flanders, Holland, Artois, and Hanault; wax, flax, pitch, tarre, maſtes, cables, and honey, from Denmark, Poland, Swethland, Ruſſia, and other northern countries; and the ſuperfluity in abundance of French and Rheniſh wines, the immeaſurable and incomparable increaſe of all which coming into this city, and the encreaſe of houſes and inhabitants within the terme and compaſſe of fifty years, is ſuch and ſo great, as were there not now two-thirds of the people yet living, having been eye-witneſſes of the premiſes and bookes of the cuſtom-houſe, which remain extant, the truth and difference of all things afore-mentioned were not to be juſtified and believed." Howe's edition of Stow's Annals of England, p. 868.

Among the circumſtances which occaſioned the vaſt increaſe of trade during this reign, may be reckoned the colonization of America and the Weſt India iſlands. The new diſcoveries, likewiſe, which were every day made in different quarters of the world, no doubt had a powerful effect in ſtimulating numbers of ſpeculating perſons to commercial exertion and adventure.

During the peaceful years of Charles I. the commerce of this metropolis ſtill continued to make rapid progreſs; and though the civil wars, for a time, had a very contrary operation, yet in the end they certainly proved beneficial. The energies of the mind were more awakened; the habits of thinking and modes of action, which then became general, taught man to feel his dignity as an individual; the different ranks of ſociety were more cloſely drawn together; the exertions of induſtry were better directed; and the means of acquiring wealth greatly augmented. The injurious tendency of monopolies was eminently counteracted; for, though never aboliſhed by any direct ſtatute, men, regardleſs of the prerogative whence they were derived, gradually invaded the privileges they conferred, and commerce was increaſed by the increaſe of liberty.

The augmented commerce of the port of London, in this reign, may in ſome meaſure be eſtimated by the quota of ſhip-money, which Charles I. impoſed on the city in 1634. By one writ, the citizens were ordered to fit out and equip, at their own charge, for 26 weeks, one ſhip of 900 tons and 930 men, one of 800 tons and 260 men, four of 500 tons each and 200 men, and one of 300 tons and 150 men. Next year they were commanded to provide two ſhips of 800 tons and 320 men each. About this time, or at leaſt very ſhortly before, prices-current were firſt printed. In 1635, an order was iſſued by the king in council to the "poſtmaſter of England for foreign parts," requiring him to open a regular communication, by running poſt between the metropolis and Edinburgh, Ireland, and a variety of other places.

Previous to the year 1640, it was uſual for the merchants to depoſit their caſh in the Tower mint; but this depoſit now loſt all its credit by the ill-adviſed meaſure of a forced loan, which the king thought proper to make. The merchants, in conſequence, found themſelves obliged to truſt their money to their apprentices and clerks. The circumſtances of the times and opportunity holding forth great inducements to frauds, many maſters loſt at once both their ſervants and their money. Some remedy became neceſſary; and the merchants now began to lodge caſh in the hands of the goldſmiths, whom they alſo commiſſioned to receive and to pay for them. Thus originated the practice of banking: for the goldſmiths, ſoon perceiving the advantages that might be derived from diſpoſable capital, began to allow a regular intereſt for all ſums committed to their care; and, at the ſame time, they commenced the diſcounting of merchants' bills at a yet ſuperior intereſt than what they paid. (See Bank and Banking.) In 1651 the celebrated navigation act was paſſed, the wiſe proviſions of which have no doubt contributed much to promote our naval and commercial greatneſs. This ſame year, coffee was introduced into London by a Turkey merchant named Edwards. (See Coffee.) The ſugar trade was now likewiſe eſtabliſhed; and upwards of 20,000 cloths were ſent annually to Turkey, in return for the commodities of that country.

The plague, which made ſuch dreadful havoc among the citizens in 1665, almoſt wholly ſuſpended the commerce of London; inſomuch that ſcarcely a ſingle foreign veſſel entered the port for the ſpace of three years. The great fire, which happened in 1666, likewiſe occaſioned incalculable loſs to numbers of the moſt opulent merchants in the city. Notwithſtanding theſe diſaſtrous events, however, the ſpirit of the ſurvivors, ſo far from ſinking, was rouſed to uncommon exertions. In the courſe of a few years, the city roſe from its aſhes with greater magnificence and ſplendour. India muſlins were firſt worn in 1670, and ſoon became prevalent. In this year alſo was the Hudſon's Bay Company eſtabliſhed, with very extenſive powers. The Greenland Fiſhing Company was incorporated in the year 1693; and the inſtitution of the Bank of England rendered the ſucceeding one juſtly memorable in the commercial annals of London. See Company.

The commerce to the Eaſt Indies having become vaſtly enlarged, and many diſputes ariſing relative to excluſive trade, a new joint ſtock company was incorporated in London, in the year 1698, by the name of "The Engliſh Company trading to the Eaſt Indies." The exiſtence of two rival companies having the ſame privileges, however, ſoon gave birth to numerous abſurdities and contradictory queſtions of right. Theſe circumſtances, and ſome others which it is unneceſſary to detail in this place, eventually produced the conſolidation of both into one, in the firſt and ſeventh years of queen Anne, by the title of "The United Company of Merchants trading to the Eaſt Indies." See COMPANIES, *Engliſh*, the *Eaſt India*, vol. ix. for a full account of this eſtabliſhment.

The number of veſſels belonging to the port of London, as appears from returns made to circular letters from the commiſſioners of the cuſtoms, amounted, in 1701, to 560; carrying 84,882 tons and 10,065 men. In 1710 the cuſtoms of this city are ſtated at 1,268,095*l.*, and thoſe of all the out-ports only at 346,081*l.*, which is more than three and a half to one. The following year beheld the incorporation of the South Sea Company, afterwards ſo baneful in its effects to numerous individuals, and ſo generally hurtful to the commercial enterpriſe of the country at large. The Royal Exchange Aſſurance and the London Aſſurance Companies were chartered about the ſame time.

During the reign of George I. the trade of London made very little, if any, progreſs. The failure of the South Sea ſcheme, the rebellion in Scotland, and the Spaniſh war, were the combined cauſes which operated to produce its retardation. In the year 1732, however, commerce began again to revive; but its advances continued comparatively ſlow, till the peace of Aix-la-Chapelle in 1748, after which it extended with uncommon rapidity. The next conſiderable check it ſuſtained was the reſult of the American war. No ſooner, however, was peace ſigned than it proceeded with renewed vigour. The grievous conſequences which many perſons apprehended to our trade, from the declaration of the independance of the United States, were only imaginary. For, even ſo ſoon after that event as the year 1784, the value of exports to America only had increaſed to 3,397,500*l.*, ſomewhat more than 332,000*l.* above the greateſt amount in any one year before the war. The net ſum of duties levied in the port of London, and paid into the exchequer this year, aroſe to the vaſt ſum of 4,472,091*l.* 13*s.* 3*d.* From this period to 1793, when the French revolution began, the commerce of London continued uniformly increaſing. In that year, however, the value of exports was upwards of two millions leſs than in the preceding year; though the imports ſcarcely ſuffered any diminution. Numerous bankruptcies conſequently took place; but the timely interference of the legiſlature, and the voting of exchequer bills to the amount of 5,000,000*l.* for the uſe of ſuch perſons as could give ſufficient ſecurity, ſoon checked the growing diſtreſs.

In the courſe of the three ſucceeding years, the appearance of things was entirely altered. In 1796 the exports of London amounted in value to 18,410,499*l.* 17*s.* 9*d.*, and the imports to 14,719,466*l.* 15*s.* 7*d.* The number of Britiſh ſhips that entered the port amounted to 2007, carrying 436,843 tons; and 2169 foreign veſſels, carrying 287,142 tons. The total entering coaſtwiſe was 11,176, including repeated voyages, which made a tonnage of 1,059,915. The following year, ſome alarm was ſpread among the merchants by the ſtoppage of the bank payments *in ſpecie*; but, through the intervention of parliament, confidence was ſoon reſtored. The net amount of the cuſtoms was 3,950,608*l.* In 1798 the importations of ſugars and rum far exceeded thoſe of any preceding year, as did likewiſe the revenue of the cuſtoms, which amounted to the ſum of 5,321,187*l.* 7*s.* 3*d.* In 1799 it had increaſed to 7,226,353*l.* 0*s.* 1*d.*, Weſt India 4½ *per cent.* duty included; but next year fell to 6,468,655*l.* 13*s.* 7*d.* The *official* value of the imports, in 1800, was 18,843,172*l.* 2*s.* 10*d.*; and of the exports, 25,428,922*l.* 16*s.* 7*d.* Their *real* value amounted in all to 68,000,000*l.*, nearly two-thirds of the value of the whole trade of the kingdom. The number of veſſels belonging to the port in that year appeared, from official documents laid before parliament, to be 2666, carrying 568,262 tons, and 41,402 men. Comparing this number with the number returned in the beginning of the laſt century, the increaſe will be ſeen to be aſtoniſhing. On the quantity of tonnage, it is nearly in the proportion of ſix to one; and on the amount of men and ſhips, as upwards of four to one. The Eaſt India Company's ſhips alone carry more burthen, by 21,166 tons, than all the veſſels of London did a hundred years ago. The average number of ſhips in the Thames and docks is 1100, together with 3000 barges employed in lading and unlading them, 2288 ſmall craft engaged in the inland trade, and 3000 wherries for the accommodation of paſſengers; 12,000 revenue officers are conſtantly on duty in different parts of the river; 4000 labourers are employed in lading and unlading, and 8000 watermen navigate the wherries and craft. See DOCKS and COMPANIES.

The *Port of London*, as actually occupied by ſhipping, extends from London bridge to Deptford, being a diſtance of nearly four miles, and from four to five hundred yards in average breadth. It may be deſcribed as conſiſting of four diviſions, called the Upper, Middle, and Lower Pools, and the ſpace between Limehouſe and Deptford: the Upper Pool extends from London bridge to Union Hole, about 1600 yards; the Middle Pool, from thence to Wapping New Stairs, 700 yards; the Lower Pool from the latter place to Horſe-ferry Tier, near Limehouſe, 1800 yards; and the ſpace below to Deptford about 2700 yards. When the houſe of commons commenced an inveſtigation reſpecting the port of London, the land accommodations were found to conſiſt of only the legal quays and the ſufferance wharfs. The former were appointed in the year 1558, under a commiſſion from the court of exchequer, authorized by an act of the firſt year of Elizabeth, for the excluſive landing of goods, ſubject to duty: they occupy the north bank of the river Thames, with ſome interruptions, from London bridge to the weſtern extremity of Tower ditch; the whole frontage meaſuring about 1464 feet. Till of late years theſe quays conſtituted the whole legal accommodation for the prodigious ſhipping trade of London; though from the increaſed ſize and tonnage of merchant veſſels, &c. the depth of the river in this part was found too ſhallow to admit of that ſpeedy clearance which the trading and mercantile intereſts require. The commiſſioners of the cuſtoms, therefore, occaſionally permitted the uſe of other landing places, which were thence called Sufferance wharfs, and of which five were ſituated on the north ſide of the river, between the Tower and Hermitage Dock, and eighteen on the oppoſite ſide: the whole having a frontage of 3676 feet. Notwithſtanding theſe additional conveniences, the whole number of quays was ſtill very far from poſſeſſing ſufficient accommodation for the increaſed trade; and more eſpecially in times of war, when large fleets of merchantmen arrive at once. The numerous evils ariſing from this want of a ſufficient ſpace for ſhipping and landing goods, and among which, the monopoly thrown into the hands of the few legal quays was not the leaſt, were for many years ſubjects of vexation and complaint. So long ago as 1674, the merchants of London petitioned the houſe of commons for redreſs againſt a combination, which the whole body of wharfingers had entered into; and in the year 1711, when the tonnage of the veſſels belonging to London did not amount to one-third part of what it does now, the commiſſioners of the cuſtoms recommended to government to make a legal quay at Bridge yard, on the ſouth ſide of the river; but it was never executed. About the year 1762, the court of exchequer directed a part of the Tower wharf to be converted into a legal quay; but this plan was relinquiſhed. The conſtruction of Wet docks had been recommended as the beſt expedient for obviating the vaſt loſs and embarraſſment ariſing from the encumbered ſtate of the quays and wharfs, and from the immenſe crowding of the veſſels on the river; and through the various ſchemes which were about this time offered for the purpoſe, &c. the houſe of commons was induced to appoint a committee; the buſineſs of which has been to inquire into the beſt mode of improving the port, and render it completely adequate to the preſent and probable commerce of London. The moſt ſkilful engineers and ſurveyors have been employed; whoſe reports, plans, &c. with the opinions and ſtatements of various merchants and other perſons, have been printed by order of the houſe of commons. Theſe reports conſtitute ſeveral volumes in folio; and are peculiarly intereſting and curious. Sir Frederic Eden publiſhed a pamphlet on the ſame ſubject, entitled "Porto-Bello, or a plan for the improvement of the port and city of London; illuſtrated by plates," 8vo. 1798. For a particular account of the various branches of commerce, commercial companies, and other objects connected with the ſame, the reader is referred to the words DOCKS, COMPANIES, EAST INDIA *Trade*, WEST INDIA *Trade*.

Cuſtom Houſe.—On the north bank of the Thames, weſt of the Tower, is a large building, appropriated to ſuch officers, clerks, tide-waiters, &c. as are immediately concerned in received the king's duties on the exports and imports of commerce. The preſent building was erected in 1718, on the ſcite of another which had been deſtroyed by fire. It is 260 feet in front; and when erected was deemed amply ſufficient for its deſtination. It has proved, however, very inadequate to the increaſed cuſtoms and buſineſs of the port; and to the vaſt commerce of London. After various ſurveys and reports made on the ſubject, it has been recently determined by the commiſſioners of the cuſtoms, that a new cuſtom-houſe ſhall be erected, upon ſuch a ſcale, and provided with ſuch numerous and various accommodations, as to meet the exigencies and demands of government. Mr. David Laing, architect to the cuſtoms, having furniſhed deſigns for a new edifice, and the ſame being approved, it is intended to proceed with the building immediately. The ſcite is from the weſtern ſide of the preſent edifice to Billingſgate quay; and its whole extent will conſtitute a range of 480 by 96 feet. In the centre is to be the long room, of 190 feet by 67. The whole building will accommodate 650 officers and clerks, the number employed here; alſo 1050 tide-waiters, and other inferior ſervants. The lower floor is to conſiſt of bondage vaults, over which are to be numerous apartments for officers and offices; and above theſe are to be ſeveral others, with the long room already noticed. The water front is to be of ſtone, with Ionic columns at each wing, and the centre will be crowned with a large dome over the long room, with ſky-lights and ventilators. It is but juſtice to ſay that the deſigns are creditable to the taſte and ſcience of the architect. The quay in front of the building is to be enlarged by filling up a part of the river. A new wall and quay are to be formed from the Tower to Billingſgate wharf, and numerous improvements will be made in the contiguous ſtreets and lanes. The river, at this place, is about 20 feet deep at high water mark. The buſineſs of the cuſtoms is managed by nine commiſſioners, whoſe juriſdiction extends over all the ports of England.

Manufactures of London.—London has long been celebrated for its manufactures as well as for its commerce. In the year 1327 the Skinners were a very numerous and rich claſs of citizens, manufacturing "ſables, lucerns, and other rich furs." Cloth-workers of different kinds were alſo noted for the excellence of their goods. In 1556 a manufactory for the finer ſort of glaſſes was eſtabliſhed in Crutched Friars, and flint glaſs, not exceeded by that of Venice, was at the ſame time made at the Savoy. About five years ſubſequent the manufacture of knit ſtockings was introduced by one William Rider, an apprentice in London, who happening to ſee a pair from Mantua at the houſe of an Italian, made another exactly ſimilar to them, which he preſented to William earl of Pembroke. (See HOSE and STOCKINGS.) A manufacture of knives was ſhortly after begun by Thomas Matthews of Fleet-ſtreet, and this has ever ſince been a flouriſhing trade. Silk ſtockings were firſt made in England in the reign of queen Elizabeth. In the fourth year of that princeſs, "John Roſe, dwelling in Bridewell, deviſed and made an inſtrument with wyer ſtringes, called the Bandora, and he left a ſon far excelling him in making bandoras, viol de gamboles, and other inſtruments." Coaches were introduced in 1564, and in leſs than 20 years became an article of great manufacture. The following year the manufacture of pins was eſtabliſhed, and ſhortly after that of needles. The making of "earthen furnaces, earthen fire-pots, and earthen ovens, tranſportable," began about the tenth year of Elizabeth, one Richard Dyer, an Engliſhman, having brought the art from Spain. Women's maſks, buſks, muffs, fans, bodkins, and periwigs were introduced and made in London ſhortly after the maſſacre at Paris in the year 1572, and in 1577 pocket watches were brought from Nuremberg in Germany, and the manufacture of them almoſt immediately commenced. In the reign of Charles I. ſaltpetre was made in ſuch quantity, as not only to ſupply all England, but the greater part of the continent. The manufactures of ſilk had likewiſe become extremely prevalent, as well as the manufacture of various ſilver articles. The printing of calicoes commenced here in 1676, and about the ſame time the weavers' loom was introduced from Holland. The revocation of the edict of Nantes in 1685, having driven many induſtrious Frenchmen from their native land, a conſiderable number came over to England and ſettled in Spitalfields. By them ſeveral of our manufactures, but particularly that of ſilk, were greatly improved, and many others introduced. Since then the productions of London have greatly increaſed both in extent and value. They now conſiſt chiefly of fine goods, and articles of elegant uſe, brought to the greateſt perfection, ſuch as cutlery, jewellery, articles of gold and ſilver, japan ware, cut glaſs, books, cabinet work, and gentlemen's carriages; together with ſuch particular articles as require a metropolis, or a port, or great mart for their conſumption, export, or ſale; *viz.* porter, Engliſh wines, vinegar, refined ſugar, ſoap, &c. The ſilk manufactories of Spitalfields, Shoreditch, and Bethnal-green pariſhes, alone employ upwards of 7000 perſons. In Clerkenwell a like number are engaged in the different branches of watch-making. Coach builders and harneſs makers are very numerous, and have brought their reſpective works to a higher degree of perfection and elegance than any in the world. Intimately connected with this ſubject is the

Trade of London, which is vaſt, various, and of extenſive effect. It may be divided into the wholeſale and retail buſineſs; for theſe are different, and under different ſyſtems of management. The great number and variety of ſhops that are diſperſed over the metropolis, the diverſity, richneſs, and multitude of articles diſplayed for ſale, and the great concourſe

courſe of perſons immediately and collaterally dependent on, and intimately connected with the ſame, are calculated to excite the aſtoniſhment of foreigners, and of perſons who have not made inquiries into the ſubject. The wholeſale trade is moſtly carried on in the city, and in the vicinity of the river, where large warehouſes and counting-houſes are eſtabliſhed. The retail trade is diſperſed through all the public ſtreets: where ſpacious and handſome ſhops are opened for the diſplay of all the neceſſaries, as well as all the luxuries of life. The ſhop-keepers of London are moſtly an active, induſtrious, and reſpectable claſs of ſociety: many of them are wealthy, and frequently retire from buſineſs in advanced age, with competence, or fortunes. Among the moſt modern ſhop eſtabliſhments upon a large ſcale, are thoſe appropriated to books and prints. Within the laſt 50 years, theſe have been prodigiouſly increaſed: and it would greatly aſtoniſh Addiſon, Johnſon, or ſir Joſhua Reynolds, could they reviſit London in 1812, and take a review of the change that has been produced ſince the time they lived, in the quantity and quality of literary productions, and in works of art. The regular, continued and perpetual intercourſe that ſubſiſts between London and all parts of the kingdom, by coaches, waggons, barges, &c. conſtitutes another and ſtrongly marked feature.

Proviſions, &c. uſed in London.—An immenſe population will require a large and ſyſtematic ſupply of proviſions; and in this reſpect, no city in the world can be better accommodated; laws, cuſtom, and open competition are all conducive to public advantage.

Animal Food.—The number of oxen annually conſumed in London is eſtimated at 110,000; of ſheep, 770,000; of lambs, 250,000; of calves, 250,000; of hogs and pigs, 200,000; beſides animals of other kinds. In ſpeaking of the conſumption of animal food in London, it is not ſufficient to notice merely the number of animals brought to market; for their ſize and fine condition ſhould alſo be conſidered in forming a proper criterion. The increaſed conſumption of the metropolis, from its accumulating population, may be eſtimated from the following average of the number ſold annually in Smithfield.

				Oxen.	Sheep.
From	1750	to	1758	75,331	623,091
	1759	—	1767	83,432	615,328
	1768	—	1776	89,362	627,805
	1777	—	1785	99,285	687,588
	1786	—	1794	108,075	707,456

It is not only in number but in weight that there has been an aſtoniſhing increaſe; this has ariſen from the improvements in breeding that have taken place in the courſe of the laſt century. About the year 1700, the average weight of an ox, killed for the London market, was 370lbs.; of a calf, 50lbs.; of a ſheep, 28lbs.; of a lamb, 18lbs.; whereas the average weight at preſent is, of oxen, 800lbs. each; of calves, 140lbs. each; of ſheep, 80lbs. each; and of lambs, 50lbs. each. The total value of butchers' meat ſold in Smithfield is calculated to amount to 7,000,000*l.* *per annum.*

Milk.—The quantity of this article conſumed in London ſurprizes foreigners; and yet few perſons have even a ſuſpicion of the amount, which is not leſs than 6,980,000 gallons annually. The number of cows kept for this ſupply is ſaid to be 8500; the ſum paid by the retailers of milk to the cow-keepers is ſtated at 317,400*l.* annually, on which the retailers lay an advance of *cent. per cent.*, making the coſt to the inhabitants 634,000*l.* Not content with this profit, the retailers add water to the milk, to the extent, on an average, of a ſixth part. Though the cow-keepers do not themſelves adulterate the milk, (it being the cuſtom for the retailer to contract for the milk of a certain number of cows, to be milked by his own people,) yet they are not wholly to be acquitted of the guilt; for in many of the milk-rooms where the milk is meaſured to the retailer, pumps are erected for the expreſs purpoſe of furniſhing water for the adulteration, which is openly performed in the preſence of any perſon who happens to be on the ſpot. See MILK.

Vegetables and Fruit.—There are at leaſt 10,000 acres of ground near the metropolis, cultivated wholly for vegetables, and about 3000 acres for fruit. The ſum paid at market annually is about 645,000*l.* for vegetables, and about 400,000*l.* for fruit; independently of the advance of the retailers, which, on an average, is more than 200*l.* *per cent.*, making the entire coſt for the London ſupply upwards of 3,000,000*l.*

Wheat, coals, &c.—The annual conſumption of wheat in London is, at leaſt, 900,000 quarters, each containing eight Wincheſter buſhels; of coals 800,000 chaldron, 36 buſhels, or a ton and half to each chaldron; of ale and porter 2,000,000 barrels, of 36 gallons each; ſpirituous liquors and compounds 11,146,782 gallons; wine 65,000 pipes; butter about 21,265,000lbs.; and cheeſe, 25,500,000. The quantity of porter brewed from July 5, 1809, to July 5, 1810, by two of the principal brewers, was, by Barclay, Perkins, and Co. 235,053 barrels, and by Meux, Reid, and Co. 211,009. (See PORTER.) The quantity of fiſh conſumed in the metropolis is comparatively ſmall, on account of the high price which it generally bears; and this appears to be the moſt ſtriking defect in the ſupply of the capital, when it is conſidered that the rivers of the kingdom, and the ſeas which ſurround it, muſt afford ſuch an amazing quantity. There are, on an average, annually brought to Billingſgate market 2500 cargoes of fiſh, of 40 tons each, and about 20,000 tons by land-carriage, in the whole 120,000 tons. The ſupply of poultry being inadequate to a general conſumption, and the price conſequently exorbitant, this article is confined to the tables of the wealthy, and the annual value does not exceed 60,000*l.* Game is not publicly ſold, yet a conſiderable quantity, by preſents, and even by clandeſtine ſale, is conſumed by the middling claſſes. Veniſon is ſold, chiefly by paſtry-cooks, at a moderate rate; but the chief conſumption, which is conſiderable, is amongſt the proprietors of deer parks.

Markets, &c.—London contains 15 fleſh markets, one for live cattle, ſheep, horſes, &c. and 25 for corn, coals, hay, vegetables, &c. Of theſe the principal are, at Smithfield, for bullocks, ſheep, horſes, ſwine, hay, ſtraw, &c.; Leadenhall, for butchers' meat, wool, hides, &c.; Billingſgate, for fiſh; Covent garden and Fleet, for fruit and vegetables; Newgate, Newport, Carnaby, and Clare markets, for butchers' meat, &c.; the corn market in Mark-lane: in Thames ſtreet is a coal exchange. London has only one annual fair, which is held in Smithfield, and continues for three days. It is moſtly devoted to objects of amuſement, ſuch as ſhows, exhibitions of beaſts, birds, ſlights of hand, and the very loweſt ſpecies of diverſion. Hence it is moſtly frequented by the loweſt and moſt depraved claſſes of ſociety. It is become more a place of riot and debauchery, than of public utility.

From what has been ſtated reſpecting the proviſions annually conſumed in London, we are naturally led to inquire into its population; an accurate knowledge of which forms a foundaa foundation for much curious ſpeculation. In the following table we are enabled to give the total number of perſons at four different periods; but it may be neceſſary to premiſe, that the laſt is preſumed to be the moſt correct cenſus ever taken in London.

Population.—London is leſs populous, for its extent, than many other great cities. The ſtreets are wider, and the inhabitants of every claſs, below the higheſt rank, enjoy more room for themſelves and families than is uſual for the ſame claſſes in foreign countries. Hence a given number of people is ſpread over a larger ſpace in London than in foreign cities. From the report on the population of Great Britain, publiſhed on the authority of an act paſſed 43 G. III. London, including the ſuburbs, appears to contain 837,906 ſettled inhabitants; but the great number of ſoldiers, mariners, provincial viſitors, coloniſts, and foreigners, who are conſtantly in London, for purpoſes of pleaſure and buſineſs, and the new inhabitants of 10,000 houſes built within the laſt ſeven years, extends the total population to more than a million. As the increaſe or diminution of the population claims a diſtinct notice, the following table will ſhew its five diviſions, at four different periods.

	In 1700	1750.	1801.	1811.
1. City of London, within the walls - - - - -	139,300	87,000	78,000	80,000
2. City of London, without the walls, including the Inns of Court -	169,000	156,000	155,000	168,000
3. City and Liberties of Weſtminſter - - - -	130,000	152,000	165,000	180,000
4. Out-pariſhes within the Bills of Mortality - - -	226,900	258,900	379,000	460,000
5. Pariſhes not within the Bills - - - - - -	9,150	22,352	123,000	135,000
Total population of the Metropolis -	674,350	675,250	900,000	1,023,000

Government of London.—In tracing the outline of the preſent government of this metropolis, it will be proper to divide it into three principal parts; *viz.* the city of London, with its dependencies; the city and liberties of Weſtminſter; and the ſuburbs connected with the two, but out of the juriſdiction of both the cities.

The civil government of the city of London is veſted, by charters and grants from the kings of England, in its own corporation or body of citizens. The city is divided into 26 principal diſtricts, called wards; and the corporation conſiſts of, 1, the lord mayor; 2, the aldermen; and 3, the common council. The lord mayor is choſen annually in the following manner: on the 29th of September, the livery, in Guildhall or common aſſembly, chooſe two aldermen, who are preſented to the court of lord mayor and aldermen, by whom one of the aldermen ſo choſen, (generally the ſenior,) is declared lord mayor elect; and on the 9th of November he enters on his office. The aldermen are choſen for life by the free houſholders of the ſeveral wards, one for each ward; except Bridge-ward without, where the election is by the court of aldermen from among thoſe who have paſſed the chair, commonly the ſenior: he is ſtyled father of the city. The common council are choſen annually by the free houſholders in their ſeveral wards, the number for each ward being regulated by ancient cuſtom; the body corporate having a power to extend the number. The common council are the repreſentatives of the commons, and compoſe one of the parts of the city legiſlature, which nearly reſembles that of the kingdom; for as the latter conſiſts of king, lords, and commons, ſo this is compoſed of lord mayor, aldermen, and common councilmen; the principal difference is, that in the three eſtates of the kingdom each enjoys a ſeparate negative, while in the city this right is denied to the lord mayor, and confined to the aldermen and common council. Before the year 1347, there were only two common-councilmen returned for each ward, which being thought inſufficient to repreſent ſuch a numerous body, it was at that time ſettled that each ward ſhould chooſe a number, not more than twelve, or leſs than ſix, according to its dimenſions; which has ſince been increaſed to the preſent number. The 26 wards are ſubdivided into 236 precincts, for each of which a repreſentative is elected in the ſame manner as the aldermen; with this difference, that as the lord mayor preſides in the wardmote, and is judge of the poll at the election of an alderman, ſo each alderman, in his reſpective ward, preſides at the election of common council men. The civil powers exerciſed by the corporation are very complete: the laws for the internal government of the city are wholly framed by its own legiſlature, called the court of common council, which conſiſts of the lord mayor, aldermen, and repreſentatives of the ſeveral wards, who aſſemble in Guildhall as often as the lord mayor thinks proper to convene them. They annually ſelect ſix aldermen and twelve commoners for letting the city lands, and this committee generally meet at Guildhall on Wedneſdays. They alſo appoint another committee of four aldermen and eight commoners for tranſacting the affairs of Greſham-college, who uſually meet at Mercer's-hall, at the appointment of the lord mayor, who is always one of the number. The court of common council alſo, by virtue of a royal grant, annually chooſe a governor, deputy, and aſſiſtants, for the management of the city lands in Ireland. This court alſo diſpoſe of the offices of town-clerk, common ſerjeant, judges of the ſheriffs'-court, common crier, coroner, bailiff of the borough of Southwark, and city garbler. The election of the recorder is veſted in the court of aldermen only. The lord mayor is the chief magiſtrate of the city: and the aldermen are the principal magiſtrates in their ſeveral wards. The lord mayor, the recorder, the common ſerjeant, and the aldermen, are judges of oyer and terminer (that is, the king's judges to try capital offences and miſdemeanors) for the city of London and county of Middleſex; and the aldermen are perpetual juſtices of the peace for the city. The two ſheriffs, (who are ſtrictly officers of the king, for many important purpoſes of his executive government,) are choſen annually by the livery of London, not only for the city, but for the county of Middleſex, the ſame perſons being ſheriffs for London, and jointly forming one ſheriff for the county. (See Philips's Letter on the Office of Sheriff, 8vo. and SHERIFF.) The adminiſtration, in all its branches, within the juriſdiction of the corporation, in all caſes embracing the city and the borough of Southwark, and in ſome caſes extending beyond, is exerciſed by members of the corporation or its officers. The borough of Southwark was formerly independent of the city of London, and appears to have been governed by a bailiff till the reign of Edward III., who granted the government of it for ever to the city. A part has been ſince incorporated with the city, under the appellation of Bridge Ward Without, and has its officers appointed by the court of common-council. The livery is a numerous, reſpectable, and important elective body; in which is veſted the election of the lord mayor, ſheriffs, chamberlain, members of parliament, bridge-maſters, ale-conners, and auditors of the chamberlain's accounts. The lord mayor, aldermen, common-council, and livery of London, form together the moſt important popular aſſembly, the commons houſe of parliament excepted, in the kingdom. On occaſions of the greateſt moment, their deciſions have inſpired general fortitude; and the whole legiſlature, when under evil influence, has been ſtruck with awe by the remonſtrance of the city, and prudently liſtened to a warning ſo ſolemnly pronounced.

The military government of the city of London was conſiderably changed by an act of parliament paſſed in the year 1794; under which two regiments of militia are raiſed in the city, by ballot, amounting together to 2200 men. The officers are appointed by the commiſſioners of the king's lieutenancy for the city of London; and one regiment may, in certain caſes, be placed by the king under any of his general officers, and marched to any place not exceeding twelve miles from the capital, or to the neareſt encampment; the other, at all ſuch times, to remain in the city. Regiments of aſſociated volunteers are formed in the reſpective wards and pariſhes, for the internal defence and peace of the metropolis. A conſiderable force is alſo maintained by the Bank, India-houſe, Cuſtom-houſe, and other public bodies, for their more immediate ſecurity. The Artillery company, which is principally compoſed of a voluntary enrolment of the younger citizens, affords an additional force of about ſix hundred men. (See ARTILLERY.) See alſo Highmore's Hiſtory of the Artillery Company, 8vo.

The civil government of the ſuburbs is veſted in the juſtices of the peace for the county. The county-hall for Middleſex is on Clerkenwell-green, where the quarter-ſeſſions are held; and a great part of the civil government is exercifed. In Bow-ſtreet, Covent-garden, is an office of police, under the direction of certain juſtices of Middleſex, who dedicate their time chiefly to that office, where are firſt examined the moſt ſerious caſes of miſdemeanor. The other public offices of police, where magiſtrates ſit daily, are—the Manſion-houſe and Guildhall, within the city. In the ſuburbs—Bow-ſtreet; Queen-ſquare, Weſtminſter; Marlborough-ſtreet; Hatton-garden; Worſhip-ſtreet; Lambeth-ſtreet, Whitechapel; High-ſtreet, Shadwell; and Union-ſtreet, Southwark: at Wapping New-ſtairs is an office for enquiry into offences connected with the ſhipping and port of London.

The police of London is under the controul of the magiſtrates belonging to theſe offices; who are appointed and paid by the government. They are required to attend on duty every day, and their province is to hear and determine petty offences, and ſubjects of diſpute between individuals. On many occaſions they inveſtigate felonies, and the higher claſſes of crimes, and commit the offenders to the proper priſons. Different acts of parliament have been paſſed on this ſubject, by which the duty and powers of the magiſtrates and ſubordinate officers are particularly defined. The police of the city of London is regulated by acts paſſed in 10 Geo. II. 11, 14, 33, and 34 Geo. III.: of Weſtminſter and its liberties, by acts of 27 Eliz., 16 Cha. I., 29 and 31 Geo. II. 2, 3, 5, 11, and 19 Geo. III.: municipal regulations are alſo eſtabliſhed in the borough of Southwark, by acts 28 Geo. II. and 6 and 14 Geo. III.

Under the foregoing acts, a nightly watch is appointed for the prevention of robberies, and the apprehenſion of offenders. To the city of London are attached 765 watchmen, and 38 patroles. The whole number of beadles, patroles, and watchmen, who are every night on duty in and around the metropolis, is eſtimated at 2044. Watch-houſes are placed at convenient diſtances in all parts, where parochial conſtables attend in rotation to keep order, receive offenders, and deliver them the next morning to the ſitting magiſtrate. In the winter ſeaſon, the roads adjacent to London are additionally guarded by horſe-patroles; and on extraordinary occaſions, the officers of the police are ordered out, or kept in readineſs, to aſſiſt in the preſervation of the public peace. The nightly watch is of peculiar utility in caſe of fire, as in every watch-houſe the names of the turncocks, and the places where engines are kept, are to be found. Beſides parochial engines, many public bodies are provided with them, and the principal fire-offices have engines ſtationed in various diſtricts, with active men and horſes. By means of the fire-plugs, water is immediately ſupplied, and the general ſecurity is guaranteed by every effort of vigilance and activity.

Acts of Parliament relative to London and its Inhabitants.—The internal economy, government, police, and civil regulations of London, are entitled to particular and commendable notice; becauſe theſe have tended to attract foreigners to ſettle here, and induced numerous families, both tradeſmen and perſons of fortune, to fix on this city as a deſirable place of permanent reſidence. It will be found that many legiſlative acts have been paſſed, and are in force, to ſecure the ſafety and comfort, and adminiſter to the luxuries of the inhabitants of this metropolis. Beſides numerous local acts of parliament that apply to particular pariſhes and diſtricts, the following have been paſſed expreſsly for the above purpoſes. It is thought adviſable to ſpecify theſe acts, and point out ſome of their items; becauſe many local advantages and conveniences of London are to be referred to theſe legiſlative proviſions.

By 3 Hen. VII. c. 9, citizens and freemen of London are authoriſed to carry their wares to any fair or market in the kingdom, in ſpite of any bye-law to the contrary. By 6 Geo. II. c. 22, the lord mayor and citizens were empowered to fill up part of Fleet Ditch, and the inheritance of the ground was veſted in them. By 29 Geo. II. c. 40, the lord mayor and common-council were empowered to purchaſe and remove buildings, to improve, widen, and enlarge the paſſage over and through London-bridge.

Buildings.—In the year 1764, a very important act of parliament was paſſed, reſpecting all buildings which are hereafter to be erected within London, Weſtminſter, the bills of mortality, and the pariſhes of Mary-le-bone, Paddington, Pancras, and Chelſea, whereby it is provided, that they ſhall be divided into ſeven rates, of which the external walls ſhall be of a thickneſs proportionate to their rates or ſizes; thoſe of firſt-rate buildings to be at the foundation 2½ bricks, or 1 foot 9½ inches thick, and decreaſing upwards in a degree therein ſpecified. Another act, of a more ample nature, was paſſed in 1774, reſpecting the buildings of London and its vicinage. By this it is required, that houſes contiguous to other buildings ſhall have party-walls between them, which walls and all chimnies and chimney-ſhafts ſhall be of brick or ſtone, or both together. (See CHIMNEY.) Party-walls ſhall be 18 inches above the buildings adjoining, and thoſe of firſt-rate buildings ſhall be at the foundation 3½ bricks, or 2 feet 6½ inches in thickneſs, decreaſing upwards in a given proportion. No receſſes to be made in party-walls (except for chimnies, fires, girders,

&c.) ſo as to reduce ſuch wall under the thickneſs required. No timber to be in the party-walls (except bonds, templets, and chains, and the ends of girders, beams, &c.) and $8\frac{1}{2}$ inches of ſolid brick-work to be between the ends and ſides of every piece of timber, except oppoſite to other timbers, and then no part of ſuch timber to approach nearer than four inches to the centre of the wall. Surveyors are to give information of irregular buildings, and the lord mayor and juſtices are to order the ſame to be demoliſhed or amended, and 50*s*. penalty is chargeable on the workman. Fire-engines and ladders to be kept in known places in every pariſh; and pariſh officers ſhall place on the mains of water-works, ſtop-blocks, and fire-cocks, and ſhall mark the houſe near. In caſe of fire, the turncock whoſe water comes firſt ſhall be paid 10*s*. Firſt engine 1*l*. 10., the ſecond 1*l*., the third 10*s*. Where officers pay rewards for fires in chimnies only, or beginning there, they are to be reimburſed by the occupier. Servants who through negligence ſet fire to any houſe, ſhall forfeit 100*l*. or be committed to hard labour for 18 months.

Butchers.—It is provided by an act of Hen. VII. c. 3, that butchers ſhall not kill beaſts within the walls of London; but this act is either ſuperſeded or not put in force.

Cattle.—By 14 Geo. III. c. 87, and 21 Geo. III. c. 67. any peace officer may arreſt perſons who drive cattle through the ſtreets of London in an improper or cruel manner. The party, if convicted, ſhall forfeit from 5*s*. to 20*s*. or be committed for one month. Perſons not being drivers of cattle, who ſhall throw ſtones or ſet dogs at them, ſhall be ſubject to the ſame penalties.

Carts.—By 1 Geo. I. ſtat. 2. c. 57, no carman, drayman, waggoner, or other perſon ſhall, within the bills of mortality, ride on a cart, dray, or waggon, not having ſome perſon on foot to guide the ſame, on forfeiture of 10*s*. This penalty is extended to within ten miles of London, by 24 Geo. II. c. 43.

Coals.—By 47 Geo. III. ſeſſ. 2. c. 68, the coal exchange ſhall be a free open market on Monday, Wedneſday, and Friday, from twelve o'clock till two, and coals are only to be ſold in market hours, under a penalty of 100*l*.

Hackney Coaches.—The commiſſioners may licence 800 by act 9 Anne, 200 more by 11 Geo. III., and 100 more by 42 Geo. III.; total 1100. The rates of fares are fixed, and an office is appointed to determine on complaints, which are alſo cognizable by magiſtrates.

Paving, lighting, and cleanſing.—Several acts were paſſed in the reign of Hen. VIII. for paving parts of the metropolis. The eaſtern ſuburbs were paved by act 13 Eliz. Various other acts were paſſed in ſubſequent reigns for paving the ſeveral parts which were added to the metropolis. The *new paving*, according to the preſent mode, commenced in 1763, under an act paſſed in the preceding year. Before this period the ſtreets were extremely inconvenient to paſſengers, the ſtones (moſtly Guernſey pebbles) being round, the kennels in the midſt, and no level footway, as at preſent, for the pedeſtrians. The alterations firſt took place in Weſtminſter, and the improvements progreſſively extended through moſt parts of the metropolis. At this period alſo took place the removal of the enormous ſigns which hung acroſs the ſtreets or over the footways, and, together with their poſts and iron ſcroll works, impeded as well the circulation of the air as the progreſs of the paſſenger.

Lighting.—As early as the year 1416, the inhabitants of London were obliged to hang out lanthorns on winter evenings. Among other improvements in the reign of queen Anne, was the introduction of globular glaſs lamps with oil burners, inſtead of the lanthorns with candles, and common lamps that had previouſly been in uſe. In 1736, an act of parliament was procured to regulate "the better enlightening the ſtreets, &c." within the city. A committee appointed to carry this act into execution, reported that "the number of houſes then inhabited and chargeable (*i. e.* ſuch as were ſubject to poor-rates) was in all 14,014, of which 1287 were under the rent of 10*l. per annum;* 4741 of 10*l*. and under 20*l*.; 3045 between 20 and 30*l*.; 1839 between 30 and 40*l*.; and 3092 of 40*l*. and upwards. The number of lamps required was 4200, excluſive of ſuch as were attached to public buildings. They were to be placed at the diſtance of 25 yards from each other in the principal ſtreets, and 35 yards in the ſmaller ſtreets and lanes. This was the commencement of the ſyſtem of defraying the charges of lighting the metropolis by parochial aſſeſſments. Since this time various other acts of parliament have been obtained for different diſtricts in the ſuburbs, and it is conjectured that more than 30,000 lamps are lit every night within the bills of mortality. From Lady-day to Michaelmas, a leſs number is uſed than during the other half of the year. In 1737, an act of parliament was paſſed for regulating and increaſing the city watch, &c. Various acts have been paſt for cleanſing the ſtreets, and preſerving them from obſtructions and nuiſances of every deſcription.

Sewers.—One of the moſt eſſential objects in a large city is good drainage; and in this reſpect London is well provided. Into the deep channel of the Thames, numerous large ſewers communicate, and convey all the ſuperfluous water, and vaſt quantities of filth from the houſes. By acts of the legiſlature, a number of perſons, ſtyled commiſſioners of ſewers, are empowered to make and repair ſewers, and levy a tax on every houſekeeper towards defraying the expences incurred by the ſame. An act of parliament was obtained as early as the reign of Henry VI. on this ſubject; and this has been amended and enlarged by ſubſequent acts, 6th Henry VIII. cap. 10; 23d Henry VIII. cap. 5; and 25th of ſame reign; afterwards in the 3d and 4th of Edward VI.; 1ſt of Mary; 13th of Elizabeth; 3d of James, and 7th of Anne. See SEWERS.

By an act of parliament paſſed in 1737, the number of playhouſes was limited to three, and all dramatic pieces intended for the ſtage, were firſt to be ſubjected to the peruſal and approbation of the lord chamberlain. See PLAYHOUSE.

The Charitable Inſtitutions of London are numerous, of various deſcriptions, and of incalculable advantage. Whilſt they adminiſter comfort, health, education, and protection to the neceſſitous, they reflect much honour on the affluent, and on all the patrons. Theſe conſiſt of hoſpitals, diſpenſaries, alms-houſes, charity ſchools, benefit ſocieties, and other eſtabliſhments. In a former part of this work, under the word HOSPITAL, will be found accounts of ſeveral, to which we ſhall add a few particulars. In the metropolis are 22 hoſpitals for ſick, lame, and for pregnant women; 107 alms-houſes for the maintenance of aged perſons of both ſexes; 18 inſtitutions for the ſupport of the indigent of various other deſcriptions; above 20 diſpenſaries for the gratuitous ſupply of medicine and medical aid to the poor; 45 free-ſchools with perpetual endowments, for educating and maintaining 3500 children; 17 other public ſchools for deſerted and poor children; 237 pariſh ſchools, ſupported by voluntary contribution, in which about 9000 boys and girls are conſtantly clothed and educated: each pariſh has alſo a workhouſe for the maintenance of its own helpleſs poor. Excluſive of this ample liſt, the ſeveral livery companies of the city of London diſtribute above 75,000*l.* annually in charities; and there is a multitude of inſtitutions, of a leſs prominent nature than the foregoing, which make the total of charitable donations immenſe. The ſums annually expended in the metropolis for charitable purpoſes, independently of the private relief given to individuals, have been eſtimated at 850,000*l.* The hoſpitals were chiefly founded by private munificence: ſome are endowed with perpetual revenues, and others ſupported by annual or occaſional voluntary ſubſcriptions. The alms-houſes were built and endowed either by private perſons or corporate bodies of tradeſmen. Many of the free-ſchools owe their origin to the ſame ſources. The magnitude of the buildings dedicated to public charities, and the large revenues attached to them, are highly deſerving of commendation; and the general adminiſtration of theſe eſtabliſhments confers a peculiar honour on the capital. The interior regulations of the hoſpitals well accord with the exterior magnitude: the medical aſſiſtance is the beſt the profeſſion can ſupply; the attendance is ample; the rooms are generally very clean and wholeſome; and the food is proper for the condition of the patients. The alms-houſes, and other inſtitutions for the ſupport of the aged and indigent, exhibit not merely an appearance, but a real poſſeſſion of competence and eaſe. From ſome of the free-ſchools, pupils have been ſent to the univerſities as learned as from any of the moſt expenſive ſeminaries: and all the ſcholars receive an education completely adapted to the ſtations for which they are deſigned. Among the free-ſchools may be particularly noted thoſe of Weſtminſter, Blue-coat or Chriſt's-hoſpital, St. Paul's, Merchant-taylors', Charter-houſe, and St. Martin's. For a very ample hiſtory and deſcription of all the charitable inſtitutions of London, the reader is referred to a volume publiſhed in 1810, entitled, "Pietas Londinienſis; the Hiſtory, Origin, and preſent State of the various public Charities in and near London," by A. Highmore, 12mo.

Inſtitutions.—For the accommodation and convenience of the immenſe population of the metropolis, the following inſtitutions have been formed for education, for promoting good morals, for advancing the uſeful and fine arts, and for charitable and humane purpoſes. For education (beſides the various ſchools already mentioned) there are 16 inns of court and chancery for ſtudents in the law, &c. (ſee COURT, *Inns of*,) and five colleges, *viz.* Sion-college, at London-wall, for the improvement of the clergy; Greſham-college, for divinity, aſtronomy, and other ſciences; the college of phyſicians, Warwick-lane, for profeſſors in medicine; one for the ſtudy of civil law, Doctor's Commons; and the Herald's-college. (See COLLEGE.) The number of private ſchools, for all the various branches of male and female education, is eſtimated at 3730; including ſome for children who are deaf and dumb.

For promoting religion and good morals London contains the following ſocieties: 1. For giving effect to the king's proclamation againſt vice and immorality, eſtabliſhed in the year 1787, and for the ſuppreſſion of vice in 1803: 2. For promoting Chriſtian knowledge, founded in 1699: 3. For the propagation of the goſpel in foreign parts, incorporated in 1701: 4. For promoting religious knowledge, by diſtributing books to the poor, inſtituted in 1750: 5. For promoting charity ſchools in Ireland: 6. For religious inſtruction to the negroes in the Weſt Indies, incorporated in 1795; and African education ſociety, inſtituted in 1800: 7. For preventing crimes, by proſecuting ſwindlers and cheats, 1767: 8. For the encouragement of ſervants, 1792: 9. For the relief of poor pious clergymen, 1788: 10. For giving bibles to ſoldiers and ſailors, 1780: 11. For giving bibles, and otherwiſe furthering the purpoſes of Sunday ſchools, 1785: Britiſh and foreign bible ſociety, 1804. To theſe may be added, Dr. Bray's charity for providing parochial libraries; and queen Anne's bounty for the augmentation of ſmall livings of clergymen.

For the promotion of learning, and advancement of the uſeful and fine arts, are the following inſtitutions: 1. The Royal ſociety, incorporated for promoting uſeful knowledge, was inſtituted 1663: 2. Antiquarian ſociety, Somerſet-place, 1751: 3. Society, or truſtees of the Britiſh Muſeum, 1753: 4. Royal Academy of Arts, Somerſet-place, 1768: 5. Society for encouragement of learning, Crane-court, Fleet-ſtreet: 6. Society for encouragement of arts, manufactures, and commerce, in the Adelphi-buildings: 7. Medical ſociety of London, Bolt-court, Fleet-ſtreet, 1773: 8. Society for the improvement of naval architecture: 9. Veterinary college, St. Pancras: 10. Royal inſtitution for applying the arts to the common purpoſes of life, 1799: 11. The London inſtitution, in the city, 1805: 12. The Surrey inſtitution near Blackfriar's-bridge, 1808: 13. The Ruſſel inſtitution, Coram-ſtreet, Ruſſel-ſquare, 1808: 14. The Literary fund, eſtabliſhed in 1790, &c.

Among the inſtitutions for charitable and humane purpoſes, the following may be enumerated: 1. The humane ſociety for the recovery of drowned and ſuffocated perſons: 2. Society for the relief of merchants' ſeamen: 3. Several ſocieties for ſupport of widows in general: and others reſpectively for the widows and orphans of clergymen, medical men, officers, artiſts, and muſicians; and for decayed muſicians, artiſts, authors, actors, and ſchoolmaſters: 4. Society for relief of perſons confined for ſmall debts: 5. Society for ameliorating the condition of the poor. With theſe benevolent eſtabliſhments may be claſſed the friendly or benefit ſocieties, of which there are in the metropolis and its vicinity about 1600, conſiſting, in general, of from fifty to one hundred members each. The members conſiſt of mechanic and labouring people, who, by ſmall monthly contributions, raiſe a fund for their ſupport in ſickneſs, and for their funerals, &c. An act of parliament was paſſed 33 Geo. III. for the ſpecial "Encouragement and Relief" of theſe ſocieties.

Places of Public Amuſement.—Conſidering the vaſt extent, population, and wealth of London, it certainly contains fewer places of public amuſement than any metropolis in Europe. Whether this be the reſult of accidental cauſes, or is to be referred to the genius and habits of the people, may, perhaps, be a matter of ſome doubt. But whatever deficiency exiſts with reſpect to number, it yields to no city in the world in the ſplendour and excellence of thoſe it poſſeſſes. Our dramatic authors are not leſs conſpicuous for the brilliancy of their compoſitions, than our actors are for the judgment and effect which they diſplay in their repreſentation. Mrs. Siddons is, perhaps, the moſt effective and powerful actreſs of the preſent, or of any former age; while her brother, Mr. John Kemble, muſt be allowed to poſſeſs talents of the firſt-rate deſcription. In the walk of tragedy many other players have evinced very conſiderable abilities: among the deceaſed may be named Garrick, Barry, Betterton, Henderſon, Booth, Quin, Ryan, and J. Palmer: and thoſe of the preſent age, moſt entitled to hiſtoric record, are Cooke, Young, and C. Kemble. It may be ſafely aſſerted that the comedians of the London theatres have advanced the mimetic art nearly to the height of perfection. The names of the late Meſſrs. Lewis, King, Parſons, Woodward, Shuter, and Edwin are juſtly honoured in the annals of the drama; and thoſe of the following actors are entitled to the unqualified commendation of the theatrical critic: Dowton, Munden, Banniſter, Fawcett, Emery, Knight, Matthews, Johnſon, Lovegrove, Liſton, Simmons, and Blanchard. Many actreſſes of the preſent age poſſeſs very conſiderable dramatic powers; particularly meſſdames Jordan, Edwin, Duncan, C. Kemble, Gibbs, S. Booth, Davenport, Liſton, and Storace. The Engliſh ſtage has many other performers of merit; but their talents are of a more limited nature than the preceding. In the operatic department, or ſinging, it has long been the faſhion to introduce Italian, or foreign ſingers to the London boards; although many of our native performers unite to ſine and powerful voices much ſcience. Mrs. Billington, Mr. Braham, Madame Storace, Mrs. Mountain, Miſs Bolton, Mrs. Martyr, Mrs. Bland, Mrs. Dickons, Miſs Kelly, Mr. Incledon, Mr. Phillips, and Mr. Bellamy, are juſtly admired, and have acquired much profeſſional fame. In action or pantomimic repreſentations, many eminent performers are to be found on the London boards. Beſides theſe there are many others very little inferior. Indeed it may be juſtly obſerved, that the companies at the principal theatres conſiſt in general of highly reſpectable performers. The muſical votary never had the means of gratifying his taſte with a higher reliſh than at the preſent period. New compoſitions of conſiderable merit daily iſſue from the preſs. The liſt of our vocal performers compriſes the names of ſome of the firſt ſingers in Europe. Our inſtrumental performers are no leſs celebrated; and our bands in general exhibit ſpecimens of the higheſt taſte and manual ſkill.

Appropriated chiefly to dramatic performances are the theatres of Drury-lane, Covent-garden, the Lyceum, and the Haymarket. Of theſe, the two firſt are upon a ſtyle of magnificence and grandeur, ſcarcely to be ſurpaſſed by any theatre in Europe. The laſt is on a ſmall ſcale, and opens in ſummer, when the others cloſe. The King's theatre, or Opera-houſe, ſituated in the Haymarket, was originally intended ſolely for the repreſentation of Italian operas. Of late years, however, dancing has conſtituted a prominent part of its amuſements, to the great injury of the operas, which are generally curtailed of an act to allow time for the ballets. The decorations of this theatre are ſplendid, and its band is conſidered as inferior only to that of the Opera-houſe at Paris. The concert of ancient muſic, generally called the King's concert, is held in the great room Hanover-ſquare, every week from the beginning of February to the end of May. It owes its origin to a ſeceſſion from the Academy of Muſic, another celebrated muſical inſtitution. The following is a liſt of the theatres, and other places of public amuſement, now occupied in London, and open to the public; a more particular deſcription of ſome of theſe will be given in ſubſequent parts of this work, under the heads THEATRE and WESTMINSTER.

Covent-garden Theatre is the moſt eminent for ſize and dramatic exhibitions. The preſent building was erected in the year 1809, from deſigns by Mr. Smirke, jun. architect. It occupies the ſcite of a former theatre, with connecting houſes, which were conſumed by fire in September 1808; and it is worthy of remark, that the whole of the preſent edifice was raiſed and finiſhed within one year. It is on a large ſcale, and the whole ſtage management is veſted in Mr. John Kemble, who has certainly made many improvements, and intereſting reformations in the internal economy, ſcience, and coſtumic repreſentation of dramas.

Drury-lane Theatre is now in the progreſs of building from deſigns by Mr. B. Wyatt, architect; whoſe model evinces much ſkill and judgment. Though not on ſo large a ſcale as the theatre of Covent-garden, it combines many conveniences and advantages not to be found in that building; and for ſeeing and hearing it promiſes to be very ſatisfactory to the audience. Mr. Whitbread has taken a very active part in cauſing this theatre to be rebuilt. A former theatre, built by Mr. Holland, was burnt in 1809.

Theatre Royal Haymarket is a ſmall, inconvenient houſe, and is allowed to be opened to the public from the 15th of May to the 15th of September.

The Lyceum Theatre, called the *Engliſh Opera-houſe*, is at preſent occupied by the Drury-lane company of performers, under the management of Mr. Arnold and Mr. Raymond. Operas and comedies are chiefly repreſented here; and ſome of theſe are acted in the beſt ſtyle. Many new dramas have been produced at this houſe.

The Opera-houſe, in the Haymarket, is appropriated to Italian operas, ſpectacles, and dances. The management of this houſe has occaſioned ſeveral legal litigations, and is ſtill involved in diſpute. Its principle is uncongenial to the Engliſh character, and it would be a memorable and laudable act to aboliſh it. Another ſimilar eſtabliſhment, ariſing out of the cabals of the former, and originating with ſome ſpeculating adventurers, has lately been opened at

The Pantheon in Oxford-road; but after a few nights repreſentation, and after debts of ſome thouſands of pounds had been contracted in fitting up, and adapting the houſe to the purpoſe, the theatre is again cloſed.

Sadlers Wells is a theatre appropriated to pantomimes, burlettas, ſpectacles, dancing, &c. and commences its ſeaſon on Eaſter Monday. The ſtage performances are invented and written by Mr. C. Dibdin, jun., who has diſplayed a peculiar and original talent in this ſpecies of compoſition. The muſical department is conducted by Mr. Reeve, and the ſcenery painted by Mr. Andrews. A novelty has been introduced at this theatre, *i. e.* of filling the whole ſpace beneath the ſtage with water, by which means ſome ſplendid and curious aquatic exhibitions have been diſplayed. It partly reſembles the naumachiæ of the Romans.

Aſtley's Amphitheatre, near Weſtminſter-bridge, is alſo a ſummer theatre, where pantomimes, burlettas, and various fetes of horſemanſhip are diſplayed. This houſe alſo commences its ſeaſon on Eaſter Monday, and generally cloſes in October, when the company remove to another theatre, called

Aſtley's Olympic Pavilion, in Newcaſtle-ſtreet, where the ſame ſpecies of entertainments are exhibited.

The Surrey Theatre, in St. George's-fields, is devoted to a ſimilar claſs of dramatic repreſentations; but ſince Mr. Elliſton has been proprietor and manager of this houſe, he has adopted a novelty, in abridging and verſifying many celebrated dramas, and playing the ſame with the accompaniment of muſic.

Another theatre in Wellcloſe-ſquare, called the *Royalty Theatre*, is occaſionally opened; and others are ſituated in Tottenham-ſtreet, in the Strand, and in Bridges-ſtreet, Covent-garden.

Vauxhall Gardens are opened twice a week in the ſummer months, when they are ornamented with an immenſe number of lamps, and a large concourſe of viſitors are entertained by vocal and inſtrumental muſic. Beſides the foregoing, London abounds with many other places of amuſement; ſuch as tea-gardens, exhibitions for ingenious inventions, and diſplay of works of fancy, &c.

Among the places of public amuſement or exhibitions, may be ſpecified—

The London Muſeum, in Piccadilly, the property of Mr. W. Bullock, who has devoted many years, much exertion, and a great expence, in collecting and arranging the moſt comprehenſive and intereſting aſſemblage of natural and artificial curioſities that was ever before amaſſed in England, or perhaps in Europe. His muſeum was originally commenced at Liverpool; but it has been progreſſively enlarged and improved. Its preſerved ſpecimens in natural hiſtory are ſelect, in the higheſt preſervation, and arranged according to the Linnæan ſyſtem. They conſiſt of about 15,000 quadrupeds, birds, reptiles, fiſhes, inſects, corals, &c. One department of the muſeum is peculiarly curious and intereſting. It is called the Pantherion, in which moſt of the known animals, in a preſerved ſtate, and in natural attitudes, are exhibited as ranging in their native, or appropriate haunts; and exact models of exotic plants, rocks, and trees, are diſperſed over the apartment: the whole interior of the ſame is painted in a panoramic manner, repreſentative of oriental ſcenery. For a particular account of this truly intereſting collection, the reader is referred to a printed "Companion to the Muſeum and Pantherion," 12mo. 2*s.* 6*d.* or to a larger work, with etchings, by Howitt, price 14*s.* A new building, in the Egyptian ſtyle, has been erected for this muſeum from deſigns by Mr. Robinſon, architect.

Polito's Muſeum, at Exeter Change in the Strand, contains a choice collection of living beaſts and birds; and to the ſtudents and lovers of natural hiſtory is very intereſting. Here are lions, leopards, tygers, oſtriches, baboons, and monkies of different kinds, kangaroos, beavers, and various other foreign animals and birds. Other muſeums and exhibitions of natural and artificial curioſities are—

Dubourgh's, in Groſvenor-ſtreet, for cork models of ſeveral temples, and ancient buildings in Rome:—*Maillardet's* automatical exhibitions in Spring-gardens, for ſome ſingular works of mechaniſm:—*Week's Muſeum*, Haymarket, is alſo for mechanical works. At *Barker's Panorama*, in Leiceſter-ſquare, are exhibited circular views, on a large ſcale, of ſeveral foreign and Engliſh cities, towns, and other particular ſcenes. Mr. Barker has evinced very conſiderable taſte and talents in this branch of art, and to him the public are indebted for the firſt invention of panoramic views. Since he commenced, ſeveral other artiſts have exhibited ſimilar pictures: Mr. Girtin, a view of London; Mr. Porter, ſeveral paintings of battles, and a *New Panorama* is now opened by Reinagle and Barker, in the Strand. See PANORAMA.

The *Fine Arts*, and *Exhibitions of Works of Art*, in London, are entitled to diſtinct and particular notice; for their preſent ſtate is calculated to ſhew the extraordinary progreſs they have made during the laſt century, and to diſplay the highly cultivated condition of the preſent age. London is the focus of the fine arts of England, and fountain-head of excellence. Here all the eminent artiſts of the country either originate, are educated, or terminate their career; becauſe all the great maſters reſide here; the beſt inſtruction is to be obtained; the moſt celebrated productions to be ſeen and ſtudied; and annual exhibitions diſplayed to the public. In the rooms of the Royal Academy at Somerſet-houſe, in thoſe of the Britiſh Inſtitution, Pall-Mall, at Spring-gardens, and in Bond-ſtreet, are annual exhibitions of paintings, drawings, ſculptural and architectural deſigns; and a careful examination of the works here exhibited will furniſh a foreigner with ample means to appreciate the individual and aggregate merits of Engliſh artiſts. Beſides theſe public exhibitions, it will be expedient to viſit the galleries of Mr. Weſt, Mr. Turner, Mr. Wilkie, Mr. Lawrence, and ſome other painters; for in theſe will be found ſeveral of the moſt meritorious works of the age. The beſt productions of our modern ſculptors will be found in the church of St. Paul's and in Weſtminſter Abbey; whilſt the true talents of the architects can only be appreciated by a perſonal examination of the buildings they have erected. The public inſtitutions devoted to the fine arts are the following:

At the *Royal Academy*, in Somerſet-houſe, is an annual exhibition, for the period of about ſix weeks, of paintings, drawings, ſketches, models, and proof-prints. This academy was eſtabliſhed by charter in the year 1768, and ſir Joſhua Reynolds appointed its firſt preſident. To this great artiſt's talents as a painter, conduct as a man, and writings on art, the Royal Academy is eſſentially indebted for its proſperity and reputation. His faſcinating productions, engaging manners, and luminous diſcourſes on painting, attracted the attention and patronage of many perſons of diſtinction, and at the ſame time rouſed the emulation and active zeal of the junior artiſts. Since ſir Joſhua's time, Mr. Weſt has occupied the preſidential chair, with little interruption, and has honoured the academic exhibitions with a continued ſucceſſion of new pictures in the higheſt branch of art. A ſeries of lectures has been annually given at the academy by different profeſſors; all calculated to advance art, and inculcate proper principles of taſte and criticiſm. Some of the preſent lecturers are deſervedly famed for profeſſional ſcience, as well as for general knowledge. In the years 1811 and 1812, the following profeſſors delivered lectures on their reſpective provinces of art: Henry Fuſeli, on painting; John Soane, on architecture; Anthony Carliſle, on anatomy (it is neceſſary to ſtate that this gentleman is not a member of the academy); J. M. W. Turner, on perſpective; and John Flaxman, on ſculpture. The Royal Academy conſiſts of forty members, called Royal Academicians, twenty aſſociates, and ſix aſſociate engravers. Further particulars of this inſtitution will be given under ROYAL *Academy*.

The *Britiſh Inſtitution*, in Pall-Mall, was eſtabliſhed by the liberal contributions of ſeveral noblemen and gentlemen in the year 1805, for the expreſs encouragement of Britiſh artiſts: and it muſt afford much gratification to the founders to contemplate its great utility and ſucceſsful effects. This inſtitution is devoted to the exhibition and ſale of pictures; and to the uſe of young ſtudents for copying from and ſtudying old paintings. Another plan has been recently adopted, which is calculated to enhance its utility and reputation. This is the purchaſe of pre-eminent pictures, which are to be preſerved as the property of the inſtitution, and from which engravings are to be made on a large ſcale. The firſt of this ſeries is a large painting by Mr. Weſt, of "Chriſt healing the Sick in the Temple!" and Charles Heath is engraving a plate from it.

The Society of Painters in Water-Colours was eſtabliſhed in November 1804, ſince which time they have annually exhibited a large and intereſting collection of drawings. This branch of art may be ſaid to have attained nearly the higheſt excellence; and many of its profeſſors have manifeſted diſtinguiſhed talents. In colouring, effect, and appropriate character, ſeveral young artiſts of the preſent age have ſurpaſſed any of the old maſters in this branch of art. Another ſociety of artiſts have made an annual exhibition of drawings in Bond-ſtreet. The collections of pictures in private houſes in London are numerous, and many of them very valuable. The moſt celebrated of theſe are the marquis of Stafford's, at Cleveland Houſe; (for an account of theſe pictures, ſee Britton's "Catalogue Raiſonné," and Treſham's "Gallery of Pictures;") the collection at Buckingham-houſe; the earl of Groſvenor's, in Groſvenor-ſtreet; Mr. Thomas Hope's, in Ducheſs-ſtreet; Mr. H. W. Hope's, in Cavendiſh-ſquare; Mr. Anderdon's, Spring-Gardens; Mr. Weſt's, in Newman-ſtreet; earl of Suffolk's, in Harley-ſtreet; the duke of Devonſhire's, in Devonſhire-houſe; Mr. Angerſtein's, Pall-Mall; ſir Abraham Hume; ſir George Yonge, in Stratford-place; lord Northwick's, in Hanover-ſquare; Mr. Weddel's, in Upper Brooke-ſtreet; lord Aſhburnham's, in Dover-ſtreet; baroneſs Lucas, in St. James's-ſquare; ſir George Beaumont, in Groſvenor-ſquare; Mr. William Smith, in Park-ſtreet; Mr. Knight, of Portland-place; Mr. Jeremiah Harman, of Finſbury-ſquare; Mr. R. P.

Knight, of Soho-ſquare; lord Radſtock, in Portland-place. Beſides theſe, there are many other collections of fine pictures in various parts of the metropolis. For much uſeful information reſpecting the fine arts in London, &c. ſee Hoare's "Inquiry into the preſent State of the Arts of Deſign in England," 8vo. 1806; alſo two other volumes in 4to. edited by the ſame intelligent and liberal writer, entitled "The Artiſt, in a Series of Eſſays;" alſo, "The fine Arts of the Engliſh School," 4to. 1812; Britton's Preface to an Account of the Corſham-Houſe Collection; and Edwards's Anecdotes of Painters in England, 4to. 1808.

Courts.—For an account of the various courts of London, the reader is referred to a former volume, under the head COURT *of Common Pleas, of Chancery, of Exchequer, of Huſtings, of King's Bench, of Marſhalſea, Mayor's, of Parliament,* (ſee PARLIAMENT,) *of the Houſe of Peers, of Star Chamber;* alſo, INNS *of Court.*

Literature and literary Publications.—To give a view of the literature of this metropolis, and to point out its preſent ſtate, compared with that of any former period, would be to develope one of the moſt intereſting traits, not only of London, but of the preſent age. The number and variety of works which annually iſſue from the metropolitan preſs are truly aſtoniſhing; while in point of ability and uſefulneſs they were probably never exceeded. There is not indeed a department, either in ſcience or general literature, which has not made conſiderable progreſs within theſe few years. The publiſhing and bookſelling buſineſſes are at preſent conducted upon very large ſcales; and, in ſpite of a long and devaſtating war, a ſucceſſion of new and intereſting volumes is continually iſſuing from the preſs. It is conjectured that nearly 800 new books and pamphlets have been annually publiſhed in London, during the laſt ten years: the groſs annual returns ariſing from the printing and ſelling of which cannot be much ſhort of one million ſterling. It is alſo eſtimated that 2000 perſons at leaſt are directly and collaterally employed in the various branches of the book buſineſs. The character and extent of periodical literature form a prominent feature of the preſent age: for the number of reviews, magazines, newſpapers, and other periodical journals, far exceed thoſe of any former period. Hence much political and general knowledge has been diſſeminated through the country; a ſpirit of inquiry and inveſtigation has been excited; and a literary turn has been given to the higher and middle claſſes of ſociety. Even the lower claſſes of mechanics and ſervants are now much accuſtomed to reading: one of the conſequences ariſing from which is that we frequently hear of men of genius and talents ſtarting up from humble ſtations, and diſplaying to the aſtoniſhed world much originality of thinking. Many inſtances of this might be adduced; but it will be ſufficient to name two or three, to prove the aſſertion: Burns, Dermody, and Bloomfield, the poets; and Drewe, the metaphyſician of Cornwall. Nothing can more plainly ſhew the reading character of the preſent times, than a knowledge of the number of newſpapers printed and circulated; and which number is thus ſtated in "The Picture of London for 1812:" "Of the morning papers, there are ſold about 17,000 of theſe publications; of the daily evening papers, about 12,000; and of thoſe publiſhed every other day, about 10,000. There are alſo about 26,000 ſold of the various Sunday papers; and about 20,000 of the other weekly papers: in all, the enormous number of 232,000 copies *per* week; yielding to their proprietors from the ſale 5800*l.*, and from advertiſements 2000*l.* more; of which the revenue to government is full 4000*l.* and the net proceeds to the proprietors about 1000*l.*; the remaining 2800*l.* affords employment and ſubſiſtence to about 50 writers and reporters, 300 printers, 100 vendors, and 100 clerks and aſſiſtants; beſides paper-makers, ſtationers, type-founders, &c. full 200 more. If to theſe be added the weekly calculation of 250,000 copies of provincial papers, yielding 10,000*l.* *per* week, and ſupporting the induſtry of 1500 perſons;—what a wonderful idea is afforded of the agency and influence of the preſs in this empire; and how eaſily is it accounted for, that we are the moſt free and moſt intelligent people on the face of the earth." Under the words MAGAZINE, NEWSPAPER, and REVIEW, we ſhall have opportunities of detailing many facts and peculiarities reſpecting theſe different publications. See alſo JOURNAL, *Literary*. London abounds with bookſellers' ſhops and circulating libraries. It is aſſerted that the firſt circulating library eſtabliſhed in this town was by a Mr. Baths, about the year 1740; but Alan Ramſay had founded one at Edinburgh as early as the year 1725. In London there are publiſhed ſeventeen newſpapers daily, and eighteen or nineteen every Sunday, beſides eighteen once or twice a week. The number of monthly magazines and reviews amounts to fifty; in addition to which, there are ſeveral works publiſhed quarterly, or at irregular periods.

Societies for the Encouragement of the Arts, Sciences, &c.—London poſſeſſes a variety of inſtitutions formed with a view to the advancement of the different branches of art and ſcience; among theſe the Royal Society undoubtedly takes the lead, being compoſed of the moſt diſtinguiſhed literary and ſcientific characters of the preſent age. It was firſt inſtituted at the cloſe of Cromwell's rebellion, at which time its meetings were held at Oxford. In 1659 they were adjourned to Greſham college, London; but of late years have been held at an apartment in Somerſet houſe. This ſociety was incorporated in 1663, when the celebrated ſir Iſaac Newton was preſident, and has, through the medium of its Tranſactions, and by its patronage, probably contributed, more than any ſimilar body in the world, to promote uſeful and practical knowledge. (See ROYAL *Society*.) The ſociety of Antiquaries, which holds its meetings in the ſame place with the Royal Society, was incorporated by Geo. II. in the year 1751. The object of this ſociety is to encourage reſearch in the elucidation, not only of our national antiquities, but of the antiquities of other countries. It has publiſhed ſixteen volumes, called the Archæologia, containing many curious and intereſting eſſays and prints, alſo a large work illuſtrative of our eccleſiaſtical architecture. (See SOCIETY *of Antiquaries*, and ANTIQUARY.) The ſociety for the encouragement of arts, manufactures, and commerce, inſtituted in 1753, and holding its meetings in the Adelphi, propoſes the attainment of its object by giving premiums for all inventions and diſcoveries which may prove, and are calculated to be, beneficial to the arts, commerce, or manufactures of the kingdom, the Britiſh colonies, or the Eaſt India ſettlements. A volume of the Society's tranſactions is publiſhed occaſionally. The walls of the great room, in which its meetings take place, are adorned with a variety of paintings from the pencil of Mr. Barry, the ſtyle and execution of which have inſured him deſerved immortality, and are really an honour to the country. The Linnæan ſociety was founded in 1788, and incorporated in 1802. (See *Linnæan* SOCIETY.) The Royal Inſtitution, ſituated in Albemarle ſtreet, owes its foundation chiefly to the ſchemes and exertions of count Rumford. Its charter of incorporation is dated in 1800. The original object of this inſtitution was to facilitate the introduction of uſeful diſcoveries and improvements in practical mechanics, and to point out, by philoſophical lectures and experiments, the application of ſcience to the common purpoſes of life. The inveſtigations and important diſcoveries of Dr. Davy, the lecturer on chemiſtry, have conferred no ſmall degree of celebrity on this eſtabliſhment, while they will not improbably be the means of effecting a complete change in our views of chemical analyſis. (See ROYAL *Inſtitution.*) The London Inſtitution, as well as the Surrey Inſtitution, embrace ſimilar objects to the one preceding. The former was founded in 1805, and the latter in 1808. Both have extenſive libraries and reading rooms, furniſhed with many of the foreign and domeſtic journals and other periodical works, together with the beſt pamphlets and new publications. The views of the Ruſſel Inſtitution are the formation of an extenſive library, conſiſting of the moſt valuable books in ancient and modern literature, to be circulated among the proprietors, the delivery of lectures on literary and ſcientific ſubjects, and the eſtabliſhment of a reading room. In Greſham college, founded by ſir Thomas Greſham, lectures are delivered gratis twice a day during the terms, on divinity, law, phyſic, aſtronomy, geometry, muſic, and rhetoric. As it happens in all inſtitutions on a ſimilar plan, the lecturers, having no ſtimulus to exertion, conſider their duty as a mere matter of routine, and are conſequently ill attended. Some idea is entertained of transferring them and the funds to the London Inſtitution, where it is hoped they may be more efficient, and anſwer better the deſign of the benevolent founder. The Britiſh Mineralogical Society was eſtabliſhed in 1799, for the expreſs purpoſe of examining gratuitouſly the compoſition of all ſpecimens of minerals and ſoils, ſent for that purpoſe by the owners of mines, agriculturaliſts, or others intereſted in the enquiry. The ſcience of entomology will probably be much forwarded by the inſtitution of the Entomological Society, which took place in 1806, and which chiefly directs its attention to the inveſtigation of the properties of ſuch inſects as are natives of the united kingdoms. The London Architectural Society has publiſhed a volume of Eſſays, 8vo. 1808: alſo an Eſſay on the Doric order. The Horticultural ſociety was founded in 1804. A Geological Society is eſtabliſhed by ſome ſcientific gentlemen in Lincoln's-inn-Fields; they have recently publiſhed an intereſting volume of their tranſactions. Before we quit theſe inſtitutions it may be proper to remark, that the number and variety of lectures that have been read in them muſt have proved beneficial to ſcience; by exciting inquiry, and inveſtigating facts by experiment. Till theſe inſtitutions were eſtabliſhed, there were but few public lectures given in London; ſuch, however, have been the influence and effect of them, that during the winter of 1811-12, it may be aſſerted that no leſs than fourteen courſes have been given at the Royal, Ruſſel, and Surrey Inſtitutions. We ſubjoin the names of the principal profeſſors: Dr. Davy, Dr. Roget, Dr. Crotch, J. M. Good, eſq., Geo. John Singer, eſq., Dr. Shaw, F. Accum, eſq., Sam. Weſtley, eſq., Mr. Hardie, Robert Bakewell, eſq., Dr. Brande, James Quin, eſq., John Pond, eſq., and Wm. Haſlitt, eſq.

The Britiſh Muſeum, ſituated in Great Ruſſel-ſtreet, is a grand national depoſitory of antiquities, MSS. and books, with various natural and artificial curioſities. It was eſtabliſhed by act of parliament in 1753, in conſequence of ſir Hans Sloane having left, by will, his muſeum to the nation, on condition that parliament paid 20 000*l.* to his executors, and purchaſed a houſe ſufficiently commodious for its reception. Since that period many valuable collections of manuſcripts, books, &c. have, at different times, been added to the Sloanean, beſides innumerable preſents from our own monarchs, foreign princes, the boards of Admiralty and Longitude, the Eaſt India Company, the various literary ſocieties of London, Edinburgh, Oxford, Cambridge, and Leyden, the Royal and Imperial academies of Bruſſels, Liſbon, &c. and a long liſt of private individuals, too numerous to be particularized. The vaſt variety of articles which this muſeum contains, its extent and value, entitle it to be conſidered equal to any in the world. Under the word MUSEUM will be given further particulars of this national repoſitory; in the mean time the reader is referred to a "Synopſis of the Contents of the Britiſh Muſeum," 8vo. 1808; and to a quarto work of "Engravings from the Gallery of Antiquities in the Britiſh Muſeum," by Mr. Taylor, Combe, and Mr. Alexander. This very handſome and intereſting work is now in the progreſs of publication, and is very creditable to the truſtees who have commenced it, and to the draftſman and author by whom it is chiefly executed.

Public Vices and Priſons.—The general tendency of the preceding ſtatements only ſhew the beſt and moſt intereſting features of the metropolis. It is our duty alſo to depict its vices; and to ſhew the numerous places that are ſet apart for the puniſhment of crimes. In Colquhoun's work on "the police of the metropolis," is ſuch a deplorable diſplay of profligacy and criminality, that an inexperienced reader, who knew London only through the medium of this publication, would conclude that its inhabitants were moſtly compoſed of vagabonds, ſharpers, pickpockets, and proſtitutes. It ſhould be remembered, however, that the work is chiefly devoted to this ſubject; and that, amidſt ſo vaſt a population, and where there are ſo many opportunities for rogues to practiſe their depredations, and ſcreen themſelves from detection, it is not ſurpriſing that ſo many are collected together, and that out of a great number ſo few are brought to condign puniſhment. To this great hive of human ſociety, the moſt vicious, and alſo the moſt learned reſort, as the beſt place for action and exertion. The worthy magiſtrate already named, has enumerated and deſcribed eighteen different claſſes of cheats and ſwindlers who infeſt the metropolis, and prey upon the honeſt and unwary: beſides perſons who live by gambling, coining, houſebreaking, robbery, and thoſe who plunder on the river. He deduces the origin of moſt of the crimes from alehouſes, bad education of apprentices, ſervants out of place, Jews, receivers of ſtolen goods, pawnbrokers, low gaming-houſes, ſmuggling, aſſociations in priſons, and prevalence of proſtitution. No leſs than 50,000 proſtitutes are ſuppoſed to live in the metropolis. An amazing number, and a diſtreſſing circumſtance to contemplate: for it is preſumed that eight-tenths of theſe die prematurely of diſeaſe and in wretchedneſs, having previouſly corrupted and contaminated twice their own number of young girls and young men. The following is a liſt of the public priſons.

1. Newgate, being the city and county goal for debtors, felons, libellers, and other offenders againſt government. See NEWGATE.

2. Giltſpur-ſtreet Compter was erected in 1791, for debtors, felons, and perſons committed for miſdemeanors. It is ſituated near Newgate, and is a large, commodious building.

3. Ludgate, adjoining to the laſt mentioned, is appropriated only to debtors who are freemen of the city of London, clergymen, proctors, or attornies.

4. The Poultry Compter is chiefly for debtors. It is ſituated near the Manſion-houſe, and has one ward ſet apart for Jews: the only priſon in England that has ſuch a proviſion.

5. The Fleet Priſon is for debtors, and for ſuch perſons as are committed for contempt of the courts of chancery.

6. The Savoy Priſon, in the Strand, is excluſively devoted to deſerters and military delinquents.

7. The New Priſon, Clerkenwell, is the goal for the county of Middleſex, for felons, and perſons fined.

8. The Priſon for the Liberty of the Tower of London, is at Bethnal-green, and is uſed only for ſoldiers belonging to the Tower.

9. Whitechapel Priſon for debtors in the 5*l.* court.

The houſes of correction are

10. The City Bridewell, Bridge-ſtreet, Blackfriars.

11. Tothill-fields Bridewell.

12. Cold Bath Fields Penitentiary Houſe.

13. New Bridewell, in the borough of Southwark.

14. County goal for Surrey, in the borough of Southwark, for felons and debtors.

15. New goal, Southwark, or Borough Compter, for felons and debtors.

16. Clink goal, for the diſtrict of that name, in Southwark.

17. The Marſhalſea goal, Southwark, for pirates, and for perſons arreſted for ſmall debts in the Marſhalſea court.

18. King's-bench priſon, St. George's Fields, for debtors, and for perſons committed for contempt of the court of King's-bench, of which this is the peculiar priſon.

Public Buildings.—It will ſurpriſe a foreign architect to look through the wealthy city of London, and perceive ſo few public edifices that diſplay architectural beauty, or grandeur. Various circumſtances have conſpired to occaſion this; and not want of abilities in our artiſts: for many names can be mentioned, both of deceaſed and living architects, whoſe deſigns would honour and ornament any city. Thoſe whoſe works are moſt conſpicuous in London, are Inigo Jones, ſir Chriſtopher Wren, Gibbs, Hawkſmoor, Dance, Soane, Samuel Wyatt, Jupp, ſir Robert Taylor, Smirke, Milne, Holland, and Adams. The public edifices of London, are bridges, (for an account of which ſee BRIDGES,) churches, public offices, hoſpitals, and private manſions. Squares and regular ſtreets conſtitute a diſtinguiſhing feature of town architecture. Some of the public buildings are ſpacious, commodious, judiciouſly adapted to their reſpective purpoſes, and diſplay beautiful, fine, and even grand parts. The Engliſh architect is juſtly noted for the ſkill and judgment he often evinces in deſigning and adapting the interior of his buildings: and this is certainly the moſt eſſential part of the profeſſion. The principal public edifices within the precincts of the city, and in the eaſtern part of the town, are the Tower; the New Mint; the Trinity Houſe; the Bank; the Manſion Houſe; the Royal Exchange; the Eaſt India Houſe; the Auction Mart; the Commercial Mart; the Cuſtom Houſe; the Exciſe Office; Guildhall; the bridges of London and Blackfriars; the Poſt-office; Newgate; Giltſpur-ſtreet Compter; St. Luke's Hoſpital; the churches of St. Paul, Bow, St. Stephen's Walbrook, St. Bride's Fleet-ſtreet.

Tower of London.—This celebrated building ſtands on the north bank of the river Thames, at the eaſtern extremity, and juſt without the limits of the city. If credit is to be given to the ſtatement of Fitz-Stephen, it owes its original foundation to Julius Cæſar, but this aſſertion is ſupported by no evidence. The firſt authentic notice of it is, that William the Conqueror erected a fortreſs here immediately upon his obtaining poſſeſſion of London in the year 1066, with the view of intimidating the citizens from any oppoſition to his uſurpation This monarch ſeems, about twelve years afterwards, either to have much enlarged the previous edifice, or to have built another on its ſcite or near it. This building forms, what is now called, the White Tower, from its having been repaired and white-waſhed by Henry III. in the year 1240. It is a large ſquare ſtructure, ſituated near the centre of the preſent fortreſs, and ſurmounted by four watch towers, one of which is uſed as an obſervatory. It conſiſts of three lofty ſtories, in the firſt of which are two grand rooms, one of which is a ſmall armory for the naval ſervice. The other buildings and fortifications have been erected at different periods. The principal of the former are, the church dedicated to St. Peter *ad vincula*; the ordnance office; the mint; the record office; the jewel office; the horſe armory; the grand ſtore-houſe; the new or ſmall armory houſes belonging to the officers of the Tower, and barracks for the garriſon. The whole compriſes, within the walls, an extent of twelve acres and five roods. The exterior circumference of the ditch, which entirely ſurrounds it, meaſures 3156 feet. This ditch, on the ſide of Tower-hill, is broad and deep, but becomes much narrower on that neareſt the river, from which it is divided by a handſome wharf, having a platform upon it, mounted with ſixty-one pieces of cannon. Beſides theſe, there are a number of great guns, arranged as ſmall batteries, on different parts of the walls. The chief entrance is by a ſtone bridge thrown over the ditch on the weſt-ſide of the Tower. At the outer extremity of this bridge are two gates, and within the ditch another, all which are ſhut every night, and opened in the morning with particular formality. The wharf is connected with the Tower by a drawbridge, near which is a cut leading from the ditch to the river, ſecured by a gate called Traitor's Gate, from the circumſtance of ſtate priſoners having been formerly conveyed by this paſſage to Weſtminſter for trial.

This fortreſs was a palace, inhabited by various ſovereigns of England till the reign of queen Elizabeth. Since that period it has been chiefly uſed as a ſtate priſon, and as a place of ſecurity for arms and property belonging to the crown. In one of the rooms of the White tower, called Cæſar's chapel, a variety of ancient records of the court of chancery are depoſited. All the models of new invented engines of deſtruction, which have been preſented to government, are preſerved in another room adjoining. The old mint, and the houſes belonging to the officers employed in the coinage, occupied nearly a third of the whole fortreſs. A yard, to the right of the weſtern entrance, contains the royal menagerie. In the Spaniſh Armory are kept the trophies of the celebrated victory over the Spaniſh armada; the axe with which the unfortunate Anne Bullen was beheaded; and a repreſentation of queen Elizabeth, dreſſed in the armour ſhe wore when ſhe addreſſed her army at Tilbury, in the year 1588. The Small Armory, one of the fineſt rooms of its kind in Europe, contains complete ſtands of arms for upwards of 100,000 men, arranged in a moſt elegant manner, beſides other curioſities. Under this armory is another very noble room belonging to the royal train of artillery, where many beautiful and uncommon pieces of cannon may be ſeen. The Horſe Armory is filled with curioſities of different kinds. Among theſe are the figures of the kings of England on horſeback, chiefly dreſſed in the ancient armour. In the Jewel Office are preſerved the imperial regalia, and all the crown jewels worn by princes and princeſſes at coronations. Independently of ſeveral, which are ineſtimable, the value of the precious ſtones and plate in this office conſiderably exceeds two millions ſterling. Theſe, as well as the government of the whole Tower, are entruſted to the care of an officer, called the conſtable of the Tower, who has under him a lieutenant, deputy-lieutenant, tower-major, gentleman porter, and a number of inferior officers. The garriſon is compoſed of a detachment from the guards. The riſing ground adjacent to the

Tower is called Tower-hill. The right of the city to this ſpot was long diſputed by the crown, but in the reign of Edward III., ſome of the king's officers having erected a gallows here, the citizens remonſtrated, whereupon that monarch iſſued a proclamation, which he diſavowed in the act, and virtually acknowledged the city's juriſdiction, by delivering over the perſons about to be executed to the ſheriffs; and deſiring that they ſhould preſide at their execution. On the ſcite of the old victualling office, to the eaſt of the Tower, an extenſive building has been lately erected from deſigns by Mr. Smirke, jun. for the Mint. It is compoſed of a long front of ſtone, conſiſting of a ground-floor, with two ſtories above; the whole ſurmounted by a handſome baluſtrade. The wings are ornamented with pilaſters, and in the centre are ſeveral demi-columns, over which is a pediment, decorated with the arms of England. The porch is covered with a gallery, baluſtrades, &c. all of the Doric order. Adjoining are houſes for the principal officers.

Manſion-houſe.—This building, the reſidence of the lord mayor of London, is ſituated to the weſt of Lombard-ſtreet and Cornhill. It is of an oblong form, and conſtructed of Portland ſtone. From its maſſive ſtyle and vaſt extent, it is calculated to make a magnificent appearance, but the effect is deſtroyed by its confined ſituation. A wide and lofty portico, compoſed of ſix fluted pillars of the Corinthian order, with two pilaſters at each ſide of their pediment, of the ſame order, form the chief ornament of the front. Under this portico is a low baſement ſtory, in the centre of which is the gate-way leading to the kitchen and offices. A flight of ſteps aſcends to the principal entrance door-way beneath the portico. Theſe ſtairs are incloſed by a ſtone baluſtrade, continued along the whole length of the front. The pediment of the portico is adorned with a piece of ſculpture emblematical of the wealth and grandeur of the city. In the centre is a female figure repreſenting the city, having a wand in her right hand, and her left reſting on the city arms. On her head is a mural crown, and under her left foot a figure of Envy. Near her on the right is a cupid, with the cap of liberty affixed to a ſhort ſtaff, leaning on his ſhoulder, and beyond him reclines a ſea god, to repreſent the Thames, having at his ſide an anchor faſtened to a cable. To the left of London is Plenty, with a cornucopia, and behind her two naked boys, with bales of goods to denote Commerce. The weſt ſide of this edifice preſents a range of very noble windows, placed between coupled Corinthian pilaſters. Its interior exhibits a ſufficient degree of ſplendour, but is far from being comfortable, as many of the rooms are dark. Some of the apartments are very large, and fitted up in a ſumptuous ſtyle; particularly the Egyptian hall, the ball-room, &c.

Commercial Hall.—It has long been a complaint in the city that ſome reſpectable place of general accommodation was wanted for the diſpoſal of imported merchandize, but principally for that of colonial produce. Several attempts have been made to remedy this defect, but without ſucceſs. About a year ago, Meſſrs Smith, Marten, and St. Barbe called a meeting of merchants and brokers, in order to eſtabliſh an inſtitution for this purpoſe. A large ſubſcription was raiſed almoſt inſtantly, and as ſoon as a plot of ground, ſufficiently large, and in a ſuitable ſituation, could be procured, a number of plans were ſubmitted by different architects, from an examination and compariſon of which, a new deſign was formed and carried into execution under the direction of J. Woods, jun. whom the committee choſe for their architect. The original intention of the eſtabliſhment was principally for the accommodation of public ſales, but it has been extended to provide equal conveniences for ſale by private contract; and thus to form a complete market for ſugar, cotton, coffee, tobacco, indigo, and other imported goods.

The building is compoſed of two principal parts. The front conſiſts of an entirely new edifice, 64½ feet long, and 39 feet broad, with a ſtone front, ornamented with ſix columns of the Ionic order, adopted, with little variation, from the temple of Minerva Polias, at Priene. Theſe columns are ſupported on pedeſtals, which reſt on the cornice of an inferior order, compoſed not of columns but of piers, whoſe ſquareneſs and ſolidity form a contraſt with the lighter and more varied proportions of the columns above. This order of piers forms the ground ſtory of the building. The ſpaces between the pedeſtals are filled up with baluſters, and above the windows, which are large and ſuited to the ſcale of the building, are five bas-reliefs, executed in artificial ſtone by Bubb: the middle compartment repreſenting the city of London, the four others, Navigation, Commerce, Agriculture, and the Arts. The whole of the ground-floor of this edifice is occupied by a magnificent coffee-room, at one end of which, between two columns, appear the ſtairs leading to two public ſale-rooms, one of which is about 35 feet by 30, and again on the upper floor to three more ſale-rooms, each about 25 by 20 feet.

The ſecond building formerly conſiſted of three houſes, which are now thrown into one: the lower floors are divided into a number of counting-houſes, the upper into five ſhow-rooms, the largeſt of which, ſixty feet long, is appropriated for the exhibition of goods intended for ſale.

Particular attention has been paid to the lights in theſe rooms, and by a ſucceſſion of ſky-lights ſloping to the north the perfect light of day is admitted, and the ſun effectually excluded. The ſpace between theſe buildings, and that behind the latter on the ground-floor, is occupied by a number of rooms lighted in the ſame way, all of which are intended for the ſale of ſugars.

The object of this building is the attainment of public convenience; by bringing into one point what before had been ſcattered among ſeveral coffee-houſes, and the rooms of individuals.

Eaſt India Houſe.—This edifice is ſituated on the ſouth ſide of Leadenhall-ſtreet, and compriſes the principal offices of the Eaſt India Company. It was originally founded in the year 1726, but has recently been ſo much altered and enlarged, under the ſuperintendance of Mr. Jupp, architect to the company, as to appear like an entire new building. The front, compoſed of ſtone, is very extenſive, and diſplays a general air of grandeur and ſimplicity. In the centre riſes a noble portico, ſupported by ſix Ionic fluted columns. The frieze is ſculptured with a variety of antique ornaments, and the pediment exhibits ſeveral figures emblematical of the commerce of the company, protected by his majeſty, who is repreſented in the act of extending a ſhield over them. On the apex of the pediment is placed a ſtatue of Britannia, to the eaſt of which is a figure of Aſia, and on the weſt another of Europe. The interior can boaſt of ſeveral very noble apartments, particularly the ſale-room, which may be juſtly reckoned among the curioſities of the metropolis. In this houſe the courts of the Eaſt India Company are held, and all its official and general buſineſs tranſacted. Several large and commodious warehouſes are diſtributed in different parts of the towns, where teas and other imported goods are depoſited. See Company, *Eaſt India.*

The London Monument.—This noble pillar, perhaps the fineſt in the world, ſtands on the eaſt ſide of Fiſh-ſtreet-hill, about two hundred yards from the north end of London bridge. It was erected by the celebrated ſir Chriſtopher Wren, to commemorate the dreadful fire of 1666, which deſtroyed a great part of the city, and commenced near this ſpot. This monument is a fluted column of the Doric order, with a baſe and capital, ſurmounted by a ball. Its diameter at the baſe is fifteen feet. The maſſy pedeſtal meaſures 40 feet, the column 120, the cone above it, with its urn, 42, ſo that the entire height of the pillar is 202 feet. The interior contains a flight of 345 ſteps, aſcending to a balcony, from which the viſitor has a very extenſive proſpect of the metropolis and the adjacent country. The obſcure ſituation of this beautiful and majeſtic pillar is much to be lamented, for were it placed in a conſpicuous poſition, it would form a great and ſtriking ornament to the metropolis.

The Poſt-Office is ſituated in an area on the ſouth ſide of Lombard-ſtreet. As a building, it is not only unworthy of notice, but when the importance and magnitude of its concerns are conſidered, is really a diſgrace to the country and the metropolis. Such an important eſtabliſhment ſhould be well and properly accommodated. As a national inſtitution, however, it deſerves particular attention, being perhaps the moſt perfect ſyſtem of internal economy, of its kind, in the world: it keeps up a conſtant communication, directly or indirectly, with every town in the united kingdom, as well as with every foreign port in the moſt remote degree connected with the Britiſh empire. It poſſeſſes likewiſe the double advantage of being incalculably uſeful to individuals, and affording a large revenue to the government. Indeed, of all the means of finance any miniſter ever employed, it is beyond compariſon the beſt; while at the ſame time it may juſtly be regarded as the ſoul of commerce. The preſent poſt-office was built in 1760, but ſince that time great additions have been made to the building. At the commencement of the poſt-office ſyſtem, the whole was veſted in private perſons, and was irregular, defective, and inſecure. A few years back a very important plan was ſuggeſted by Mr. Palmer, of conveying letters to all parts of the kingdom by means of mail coaches; whereby a ſpeedy communication, and ſecurity from robbery were effected. See MAIL COACHES, and POST-OFFICE.

The Trinity Houſe.—On the north ſide of Tower-hill is a large, handſome, regular building, which was erected from deſigns by Samuel Wyatt, architect. The chief buſineſs of the Trinity-houſe corporation, which was founded in 1512, is conducted here, though the old eſtabliſhed houſe is at Deptford. The corporation conſiſts of one maſter, four wardens, eight aſſiſtants, and twenty-eight elder brethren, who are ſtyled "the guild, or fraternity of the moſt glorious and undivided Trinity, and of St. Clement, in the pariſh of Deptford-Strond, in the county of Kent." The object of this corporation is to ſuperintend and guard the intereſts of the Britiſh ſhipping, both military and commercial. Their powers are extenſive; and their objects important. They have to examine the children who are inſtructed in mathematics in Chriſt's hoſpital; examine the maſters of the king's ſhips; appoint pilots for the Thames; erect light-houſes and ſea-marks in the Britiſh ſeas; grant licences to poor ſeamen who are not free of the city, to ply for fares on the Thames; ſuperintend the deepening and cleanſing of the river, &c. The Trinity-houſe contains ſome handſome apartments, particularly the hall, the ſtair-caſe, and the court-room; in one of which is a fine model of the ſhip called the Royal William; alſo portraits of twenty-four of the elder brethren, and of other eminent perſons.

The Lunatic Hoſpital, called St. Luke's, in Old-ſtreet, a large pile of building, was erected from deſigns by George Dance, who alſo built the priſons of Newgate and the city Compter. In all theſe he manifeſted much ſkill and judgment; but there is a great want of both in the new front.

The Guildhall of the city is a piece of architectural abſurdity.—It is appropriated to the chief public offices of the corporation of London: the principal of theſe is the great hall, (153 feet long, by 48 broad and 55 high,) in which the large city feaſts are held, where public meetings are aſſembled, and the lord-mayor and members of parliament elected. Here are ſeveral portraits of ſovereigns, judges, lord-mayors, &c.; alſo large marble monuments to the juſtly eſteemed lord-mayor, Beckford, the great lord Chatham, &c. Beſides the hall, the following offices are included in the preſent building; chamberlain's-office, the court of king's bench, in which the lord-mayor's court and ſeſſions of the peace for the city are held; a court of common pleas, and court of exchequer; a court, called common council chamber, for the lord-mayor, aldermen, and common council. Attached to the Guildhall is an old chapel, which formerly belonged to a religious eſtabliſhment, but is now uſed as a juſtice-room for the aldermen.

The Bank of England, an immenſe pile of building, is more extenſive in its range of offices, and more eminent for its architectural adornment and interior arrangement, than any ſingle public edifice in the metropolis: for Somerſet-houſe, or place, conſiſts of various offices, dwelling-houſes, &c. It preſents an irregular and incongruous medley of ſtyles and forms; having been built at various periods by three different architects. The oldeſt part, *i. e.* the centre of the principal, or ſouth front, with ſome apartments on the ſame ſide, was deſigned and erected by George Sampſon, in the year 1733: and the lateral wings of this façade, and the returns on the eaſt and weſt ſides, with ſeveral offices immediately attached, were built by ſir Robert Taylor, between 1770 and 1786: but the great alterations and additions that have been made ſince the year 1788 by Mr. Soane, conſtitute the prominent features of this noble edifice. It would occupy a volume to deſcribe the whole arrangement and extent of the bank: it muſt ſuffice on the preſent occaſion to mention a few of its leading characteriſtics. The whole buildings are included in an area of an irregular form, the exterior wall of which meaſures 365 feet in front, or on the ſouth ſide; 440 feet on the weſt ſide; 410 feet on the north ſide, and 245 feet on the eaſt ſide. This area compriſes eight open courts, one rotunda, or circular room, ſeveral large public offices, committee rooms, and private apartments for the reſidence of officers and ſervants. The principal ſuite of rooms is on the ground-floor, and there is no floor over the chief offices; but it is neceſſary to ſtate, that beneath this floor, and even below the ſurface of the ground, there is more building, and more rooms than above-ground. Part of the edifice is raiſed on a marſhy, ſoft ſoil, for the ſtream called Wallbrooke ran here, and it has been neceſſary to pile the foundation, and conſtruct counter arches beneath the walls. The following is a liſt of the principal public rooms, with their dimenſions: on the ſouthern ſide, dividend-pay office, 44 by 40 feet; the three *per cent.* reduced office, 50 by 40 feet; pay-hall, 40 by 70 feet; ſtock-office, 60 by 45 feet: three others of nearly the ſame dimenſions; the rotunda, 55 feet in diameter; the conſol office, 80 feet by 48, is a noble room; court-room, 60 by 30 feet, adjoining which is the great committee room; office for notes under 5*l.*, 60 by 40 feet; and the chief caſhier's office, 45 by 30 feet. Beſides theſe, the Bank contains many other offices and apartments: among which may be named the ſecretary's office, bullion office, deputy governor's rooms, general caſh-book office, out-teller's office, land-tax redemption office, loan, or property office, drawing office, accomptant's office for the new ſpecie, cheque office, reduced annuity office, dividend pay-office, armoury, bank-note printing-office, engraver's rooms, the library, &c. Such is the extenſive buſineſs of the bank, that above 1000 perſons are employed in its various offices. Of the architectural characteriſtics of this edifice, its extent, arrangement, and adaptation to the accumulated and increaſing buſineſs of the Britiſh bank, it will be impoſſible to convey ſatisfactory information, in a limited ſpace, and without illuſtrative prints. We can only briefly deſcribe a few of the principal features. The oldeſt part by Sampſon, combines a degree of ſimplicity united with grandeur; and was admirably adapted to its original purpoſe. It beſpoke the character of a public edifice, with a rich and appropriate ſtyle of deſign. The whole aſſumed an air of dignity and importance, with a ſufficiency of ornament and dreſs. On a ruſticated baſement are two ſtories with Ionic columns, and a bold entablature. An uniformity of character pervades the whole. With ſuch a model before him, it is aſtoniſhing that ſir Robert Taylor did not deſign his additions in the ſame ſtyle, or in one that harmonized with it: but it ſeems evident that he did not feel or appreciate the charms of ſimplicity. He preferred prettineſs to propriety, and gaiety to grandeur, and therefore deſigned the wings, with the offices immediately attached, in the moſt gorgeous ſtyle of Roman architecture. Corinthian fluted columns, arranged in pairs, are placed along the whole front, ſupporting pediments at both extremities, and a baluſtraded entablature between.

In this façade, the architect has copied a building of Bramantes in the Belvidere gardens at Rome; but this very circumſtance impeaches his taſte and judgment. For though the ſtyle and deſign might have been appropriate and judicious in a ſmall ornamental building, it is very abſurd in a great national ſtructure, where ſolidity, ſecurity, and ſimple grandeur were required. The four and five *per cent.* ſtock offices are truly diſguſting, as works of art; and alſo very defective as rooms for buſineſs. They are both exact imitations of the interior of the church of St. Martin's-in-the-Fields. The forms and proportions of the exterior columns much excite our admiration. In the additions and improvements made to the bank by Mr. Soane, ſince his appointment in 1788, we find many novelties in deſign, and ſkilful appropriations. The rotunda is a ſpacious circular room, with a lofty dome; where a large and heterogeneous maſs of perſons of all nations and claſſes aſſemble on public days to buy and ſell ſtock. The deſign and conſtruction of the dome, by the laſt named architect, are entitled to the particular notice and admiration of ſtrangers. In the three *per cents.* warrant office, the ſame profound artiſt has diſplayed much taſte and ſkill. It is an oblong room, with a vaulted ceiling ſpringing from ornamented piers; and in the centre is a handſome dome, or lanthorn light, ſupported by caryatides. The ſoffites of the arches are decorated with pannels, roſes, and other objects in ſtrict conformity to the practice of the ancient architects. It is worthy of remark, that the whole is conſtructed without timber. Branching from this apartment is another, called the interior office, adapted to clerks whoſe buſineſs is to guard againſt forgery. It opens to Lothbury court, which is a grand diſplay of architectural deſign, two ſides of it being formed by open ſcreens, with handſome fluted columns of the Corinthian order. Theſe are copied from the little temple at Tivoli. On the ſouthern ſide of this court is a noble arch of entrance to the bullion court, and to other offices. This arch and façade are deſigned after the model of the celebrated triumphant arch of Conſtantine at Rome. On the ſides of the great archway, are four handſome fluted columns, ſupporting an entablature, and four ſtatues emblematic of the four quarters of the globe. In pannels are baſſo-relievi, executed by that great maſter of ſculpture, Banks, allegorically repreſenting the Thames and Ganges. The chief caſhier's office is a noble apartment, in the deſign of which the architect has again ſhewn his enthuſiaſtic attachment to claſſical antiquity. It is in imitation of the temple of the ſun and moon at Rome, and is ſpacious, ſimple in decoration, and cheerfully lighted by large and lofty windows. In the accomptant's office, governor's-court, veſtibule and paſſage from Prince's-ſtreet, and receſſed portico at the north-weſtern angle, are ſome ſpecimens of architectural deſign, which muſt excite the admiration of every accompliſhed connoiſſeur. In all theſe parts we recognize the forms, ſtyle, and detail of the beſt antique ſpecimens, carefully adapted to their reſpective ſituations, and calculated to gratify the eye and ſatisfy the judgment. Stability is certainly the moſt eſſential object in ſuch a building; but beauty and grandeur are equally deſerving of attention; for the Britiſh bank is rich, its proprietors are preſumed to be men of learning and ſcience, and under their auſpices we are entitled to look for ſuch actions and ſuch works as ſhall be ornamental and honourable to the character and taſte of the kingdom. In the great enlargements that have been recently made in the preſent building, it is evident, that the architect has been particularly attentive to the immediate buſineſs of the company, the ſecurity of their property from fire and depredation, and a chaſte, claſſical ſtyle of embelliſhment. Theſe remarks and deſcriptions are the reſult of a recent examination of the building.

Places of Worſhip.—London is diſtinguiſhed by the number and variety of its places of worſhip. It contains 116 churches of the eſtabliſhed religion; above 80 chapels of eaſe on the eſtabliſhment, in pariſhes where the population is too great for their reſpective churches; 11 Roman Catholic chapels; 17 churches and chapels belonging to foreign Proteſtants; ſix ſynagogues of the Jews; and 132 meeting-houſes of the different denominations of Engliſh Proteſtant diſſenters.

Of the 116 churches above-mentioned, 74 are within the walls of the city, 10 in London, without the walls, nine in the city and liberties of Weſtminſter, five in the borough of Southwark, and 18 in the ſuburbs, not included in theſe claſſes. Of theſe we can only particulariſe a few; for deſcriptions of the whole would require a large volume. Pre-eminent above all the buildings of the metropolis, is the

Cathedral Church of St. Paul, which holds the moſt diſtinguiſhed rank among the modern works of architecture in the Britiſh empire. The original cathedral was commenced in the year 610, by Ethelbert, king of Kent, and the building, with its revenues and privileges, were greatly increaſed by ſucceeding ſovereigns. This ſtructure was deſtroyed by a conflagration in 1086; after which, Maurice, then biſhop, commenced the magnificent edifice which immediately preceded the preſent cathedral. So great was the magnitude of the building, that neither Maurice, nor his ſucceſſor De Belmeis, were able to complete the undertaking, though each of them preſided twenty years, and expended great ſums in the proſecution of it; the latter prelate appropriated the whole revenue of his biſhopric to carrying on the work, and ſupported himſelf and family by other means. After his death the building was for ſome time ſuſpended, and the eaſtern part, or choir, was burnt in the year 1135. At what period it was reſtored is uncertain; the grand ceremony of conſecration was performed in 1240; large additions were afterwards made to the ſtructure, and it was not till the year 1315 that the church was entirely completed; being 225 years from the time of its foundation by Maurice. This ancient cathedral muſt always be regarded as one of the great works of architecture of the middle ages; in dimenſions it far exceeded every other religious edifice in this country; and it is repreſented by hiſtorians as equally pre-eminent in magnificence and ſplendour of ornament. (For an account of this edifice, ſee Dugdale's Hiſtory of St. Paul's.) In the reign of James I., the cathedral having fallen to decay, a royal commiſſion was iſſued for its repair; but nothing of conſequence was done till the advancement of Laud to the ſee of London, in the ſucceeding reign. This prelate exerted himſelf zealouſly in favour of the neglected building; a ſubſcription was collected to the amount of 101,330*l.* 4*s.* 8*d.*; and Inigo Jones was appointed to ſuperintend the undertaking. He commenced his operations in 1633; and the work went rapidly on till the breaking out of the civil war threw all things into confuſion, and the parliament confiſcated the unexpended money and materials. After the reſtoration, the repairs were again commenced; but after much labour and expence, the great conflagration in 1666, deſtroyed the chief part of the building, and irreparably damaged the remainder. Still, however, the magnitude of the work, and the contemplation of the vaſt expence of building a new cathedral, occaſioned a lapſe of ſeveral years before it was finally determined that all attempts at reparation were hopeleſs. The impracticability of reſtoring the ancient church being now apparent, Dr. (afterwards ſir) Chriſtopher Wren, was ordered to prepare plans for a new cathedral. The pulling down the remaining walls of the old ſtructure, and the removal of the rubbiſh to the amount of 47,000 loads, proved exceſſively laborious as well as dangerous, and ſeveral men were killed in the progreſs of the work. This being completed, the firſt ſtone of the new edifice was laid June 21, 1675; and the deſign was proſecuted with ſuch diligence and ſucceſs, that within ten years the walls of the choir and ſide aiſles were finiſhed, together with the circular porticoes on the north and ſouth ſides. The laſt or higheſt ſtone of the building was laid at the top of the lantern in the year 1710; and ſhortly afterwards the queen and both houſes of parliament attended divine ſervice in the new cathedral. The whole ſtructure was thus completed in thirty-five years, by one architect, ſir Chriſtopher Wren, and one maſter maſon, Mr. Thomas Strong, and while one prelate, Dr. Henry Compton, filled the ſee of London.

The general form or ground plan of St. Paul's cathedral is that of a Latin croſs, with an additional arm or tranſept at the weſt end, to give breadth to the principal front, and a ſemicircular projection at the eaſt end for the altar. At the extremities of the principal tranſept are alſo ſemicircular projections for porticoes; and at the angles of the croſs are ſquare projections, which, beſides containing ſtaircaſes, veſtries, &c. ſerve as immenſe buttreſſes to the dome, which riſes from the interſection of the nave and tranſept, and is terminated by a lantern, ſurmounted by a ball and croſs of copper gilt. The weſt front of this fabric conſiſts of a noble portico of two orders, the Corinthian and the Compoſite, reſting on a baſement formed by a double flight of ſteps, of black marble, and ſurmounted by a ſpacious pediment. On each ſide is a tower, with columns, &c.; one ſerving as a belfrey, the other as the clock-tower. In the tympan of the pediment is a very large piece of ſculpture, in baſſo-relievo, of the converſion of St. Paul; and on the apex a gigantic ſtatue of the ſame apoſtle; whilſt on either hand, along the ſummit of the front, are other coloſſal ſtatues of St. Peter, St. James, and the four evangeliſts. Large ſtatues of the other apoſtles are placed upon pediments on the ſide walls of the fabric. The dome is the moſt remarkable and magnificent feature of the building. It riſes from a circular baſement, which, at the height of about twenty feet above the roof of the church, gives place to a Corinthian colonnade, formed by a circular range of thirty columns. Above the colonnade, but not reſting upon it, riſes an attic ſtory with pilaſters and windows, from the entablature of which ſprings the exterior dome, which is covered with lead, and ribbed at regular intervals. Round the aperture, at its ſummit, is another gallery; and from the centre riſes the ſtone lantern, which is ſurrounded with Corinthian columns, and crowned by the ball and croſs.

In its interior form, this edifice is entirely conſtructed on the plan of the ancient cathedrals, *viz.* that of a long croſs, having a nave, choir, tranſepts, and ſide aiſles; but, in place of the lofty tower, the dome in this building riſes in elevated grandeur from the central interſection. The architectural detail is in the Roman ſtyle, ſimple and regular. The piers and arches, which divide the nave from the ſide aiſles, are ornamented with columns and pilaſters of the Corinthian and Compoſite orders, and are further adorned with ſhields, feſtoons, chaplets, cherubim, &c. The vaulting of this part of the church merits great praiſe for its light and elegant conſtruction: in this, each ſevery forms a low dome, ſupported by four ſpandrils; the baſe of the dome being encircled by a rich wreath of artificial foliage. The central area below the dome deſerves particular attention: this is an octagon, formed by eight maſſive piers, with their correlative apertures, four of which, being thoſe that terminate the middle aiſles, are forty feet wide, while the others are only twenty-eight; but this diſparity only exiſts as high as the firſt order of pilaſters, at which level the ſmaller openings are expanded in a peculiar manner, ſo that the main arches are all equal. The ſpandrils between the arches above form the area into a circle, which is crowned by a large cantilever cornice, partly ſupporting by its projection the "whiſpering gallery." At this level commences the interior tambour of the dome, which conſiſts of a high pedeſtal and cornice, forming the baſement to a range of apparently fluted pilaſters of the Compoſite order, the intervals between which are occupied by twenty-four windows and eight niches: all this part is inclined forward, ſo as to form the fruſtum of a cone. Above, from a double plinth, over the cornice of the pilaſters, ſprings the internal dome; the contour being compoſed of two ſegments of a circle, which, if not interrupted by the opening beneath the lantern, would have interſected at the apex. The dome, the idea of which was confeſſedly taken from the pantheon at Rome, is of brick, two bricks thick; but, as it riſes, at every five feet has a courſe of brick, of eighteen inches long, bending through the whole thickneſs: for greater ſecurity alſo, in the girdle of Portland ſtone which encircles the low part, an enormous double chain of iron, ſtrongly linked together, and weighing nearly 96 *cwt.*, was inſerted in a channel, which was afterwards filled up with lead. Over this cupola is a cone of brick, ſo built as to ſupport a ſtone lantern of an elegant figure. The choir is of the ſame form and architectural ſtyle as the body of the church.

The dimenſions of this vaſt fabric are, height from the ground without to the top of the croſs 340 feet, extreme length within 500 feet, greateſt breadth 223 feet. The entire aſcent to the ball includes 616 ſteps. The weight of the ball, which is capacious enough to contain eight perſons, is 5600 lbs.; and that of the croſs, 3360 lbs. For a more particular deſcription of this edifice, with plan of the ſubſtructure, elevation of the weſt front, ſection of the dome, and north-eaſt view of the exterior, ſee "Fine Arts of the Engliſh School," 4to. 1812.

The particular objects of curioſity which are compriſed in this church, and generally ſhewn to ſtrangers, are the whiſpering gallery, which encircles the interior of the lower part of the dome, and is ſo conſtructed, that a low whiſper breathed againſt the wall, in any part of the circle, may be heard on the oppoſite ſide; the library, chiefly remarkable for the floor, which is conſtructed with ſmall pieces of oak, diſpoſed in geometrical figures; the beautiful model, conſtructed by ſir Chriſtopher Wren; the geometrical ſtaircaſe, the fineſt ſpecimen of the kind in Great Britain; the clock, and great bell on which it ſtrikes. The clock is of great magnitude: the length of the minute-hand is eight feet, and its weight 75 lbs.; the hour-hand five feet four inches, and its weight 44 lbs.; the diameter of the dial is eighteen feet ten inches; the length of the hour-figures two feet two inches and a half; the bell is about ten feet in diameter, and its weight nearly four tons and a quarter.

About the year 1790 a ſcheme was ſuggeſted, and has been happily carried into effect, for breaking the monotonous uniformity of the architectural maſſes in the interior of the cathedral. This was done by admitting large and noble monuments for eminent public perſons deceaſed. Theſe may with ſtrict propriety be termed *national*, as commemorative of Britiſh virtues, talents, or heroiſm. Statues are already erected for Mr. Howard the philanthropiſt, Dr. Johnſon, and ſir William Jones. Here are alſo monuments for generals Abercromby and Dundas, and for captains Moſſe, Riou, Weſtcott, Burgeſs, and Faulknor. Others are now erecting for marquis Cornwallis, lord Howe, and lord Nelſon. The latter is interred in the vault under the centre of the building; and near him, his friend lord Collingwood. Among other eminent characters who have been depoſited in theſe vaults, are ſir Chriſtopher Wren; Dr. Newton, late biſhop of Briſtol; Alexander Wedderburn, earl of Roſslyn; ſir John Braithwaite; ſir Joſhua Reynolds, preſident of the Royal Academy; and two other eminent artiſts, James Barry and John Opie, eſqrs.

Although the churches in London are moſtly plain, ordinary in architecture, and in obſcure ſituations, yet a few of them are entitled to the notice and admiration of a ſtranger. That of St. Stephen Walbrooke, built by ſir Chriſtopher Wren, is very ſmall, but is juſtly eſteemed for its novelty of deſign and architectural adornment. "The plan is original, yet ſimple; the elevation ſurpriſing, yet chaſte and beautiful; the dome, ſupported by eight arches, ſpringing from eight ſingle columns, is wonderfully light and ſcenic in its effect." (Malton's Pictureſque Tour, p. 76.) Over the altar is a fine picture repreſenting the interment of St. Stephen, by Weſt. The following churches and towers have claims to architectural beauty, or ſcientific merit. The tower and ſpire of Bow-church, in Cheapſide, by ſir Chriſtopher Wren; the tower of St. Michael's, in Cornhill; the tower and ſpire of St. Bride's, in Fleet-ſtreet; the church of St. Mary, called the New church, in the Strand, by James Gibbs; the church of St. George, in Bloomſbury, by N. Hawkſmoor, built in 1731; the tower and ſpire of St. Dunſtan in the Eaſt, by ſir Chriſtopher Wren; and the church of St. Paul, Covent Garden, by Inigo Jones.

Members of Parliament.—The city of London has no more weight in the legiſlative repreſentation of the kingdom, than two ſmall boroughs which are the property of an individual. It ſends four repreſentatives to parliament, who are choſen, not by the inhabitant houſeholders at large, but by the livery of the ſeveral companies. The right of election was anciently veſted in the freemen of the city, which gave riſe to many conteſts between the freemen and livery; till an act of parliament, paſſed in the eleventh year of George I., decided the queſtion, and gave a peremptory right to the livery only. To be poſſeſſed of this elective franchiſe, a man muſt have previouſly obtained his freedom of the city, and alſo of one of the trading companies, either by patrimony, ſervitude, or purchaſe; and muſt afterwards be admitted to the livery of his company. The preſent number of electors is about eight thouſand, which is not above a third part of the number of inhabitant houſekeepers. The elections are held in Guildhall, and the ſheriffs are the returning officers. The city ſent two members to parliament as early as 49 Henry III. The number was increaſed to four, 6 Edward II.: in that and the ſucceeding reign, four were frequently ſent; but ſince 43 Edward III., this number has been uniformly returned.

Inns of Court and Chancery.—The deſign of theſe eſtabliſhments having been curſorily noticed under Inns, it may be proper here to ſubjoin ſome further particulars relative to each. The inns of court in London are the Inner Temple, the Middle Temple, Lincoln's Inn, and Gray's Inn; but there are ſeveral other places called inns, which are appendages to the former. The Temple, belonging to the two ſocieties of the Inner and Middle Temple, is an immenſe aſſemblage of buildings, extending from Fleet-ſtreet to the Thames; and from Lombard-ſtreet, White-friars, to Eſſex-ſtreet in the Strand. It derives its name from a religious houſe, which was founded by the Knights Templars, who were cruſaders; and, in the beginning of the twelfth century, formed themſelves into a military body at Jeruſalem, for the protection of the pilgrims who viſited the holy ſepulchre. On the diſſolution of the order, the Temple was granted to the Knights Hoſpitallers of St. John of Jeruſalem; and by them it was let for 10*l.* *per annum* to the ſtudents of the law, whoſe ſucceſſors ſtill poſſeſs it. (See Hospitallers and Templars.) The Temple is an irregular building: in Fleet-ſtreet are two entrances, one to the Inner and one to the Middle Temple; the latter has a front, in the ſtyle of Inigo Jones, of brick, ornamented with four large ſtone pilaſters, of the Ionic order, with a pediment. There are four other entrances; but the gates of all are ſhut at night. The garden of the Inner Temple is of great extent, and is laid out on the banks of the Thames, with ſpacious walks, &c. The Middle Temple has alſo a garden, but ſmall: both are open to the public in ſummer. The hall of the Middle Temple is a ſpacious and curious room: the Inner Temple hall, which is ſmaller, is ornamented with the portraits of ſeveral of the judges. Each ſociety has a good library for the uſe of its ſtudents. In the treaſury chamber of the Middle Temple is preſerved a great quantity of ancient armour, which belonged to the Knights Templars. The Temple church belongs in common to both ſocieties, and is open for divine ſervice twice every day. The Knights Templars built a church on this ſcite, which being deſtroyed, the preſent edifice was erected by the Knights Hoſpitallers. It is in the early pointed and late circular ſtyles of architecture, and conſiſts of two diſtinct parts: at the weſtern end is a ſpacious round tower or veſtibule, forming a grand and ſingular entrance to the church. In this are the ſtatues of eleven Knights Templars. The organ is eſteemed one of the fineſt in the world. Since the time of Henry VIII. the ſuperior clergyman of this church is called the maſter of the Temple, and is ſo conſtituted by the king's letters patent. For an account of this church, with ground plan and prints, ſee Britton's Architectural Antiquities of Great Britain, vol. i.—Lincoln's Inn is ſituated on the weſt ſide of Chancery-lane. On its ſcite anciently ſtood a houſe of the Black-friars, and the palace of the biſhops of Chicheſter. The ground was afterwards granted to Henry Lacy, earl of Lincoln, from whom it derives its name. It appears to have reverted to the biſhops; for the preſent poſſeſſors hold it as a grant from a prelate of that ſee. Lincoln's Inn occupies a very extenſive ſpace: the buildings are moſtly old and irregular. An attempt has been made, but never completed, to rebuild the Inn on a regular plan. A conſiderable range, called the Stone Buildings, faces the weſt. This plan, the work of ſir Robert Taylor, is ſimple and elegant in its exterior architecture; and the chambers are on a grand and commodious ſcale. In the old part of the building are the hall and chapel; the firſt of which is a ſpacious room, in which the lord chancellor holds ſeals and ſittings out of term. At the upper end is a painting by Hogarth, of St. Paul before Felix. The chapel, deſigned by Inigo Jones, is ſpacious, and raiſed on large piers and arches, which form an open area beneath, uſed as a burial-place for benchers only. The chapel is open for public worſhip every morning and evening. The garden, which in ſummer is open to the public, is ſpacious, and forms one of the fineſt promenades within the capital. Lincoln's Inn has a good library, which contains a great number of manuſcripts; the greater part of which was bequeathed by lord Hale, with a ſingular injunction, that no part ſhould ever be printed. Gray's Inn is ſituated on the north ſide of Holborn, and derives its name from a lord Gray, who reſided here. In this Inn is a ſmall neat chapel, a commodious hall, and an extenſive garden, with a grove of large elm trees. The inns of chancery, which are dependent on the inns of court, are Furnival's Inn, an appendage to Lincoln's Inn: it is ſituated on the north ſide of Holborn-hill, and was the manſion of ſir William le Furneval, in the time of Richard II.—Thavies Inn, alſo dependent on Lincoln's Inn: the old fabric having been recently burnt down, a neat range of buildings is erected on its ſcite, which is near St. Andrew's church, Holborn.—Staple Inn, ſituated on the ſouth ſide of Holborn, and an appendage to Gray's Inn: in the hall are caſts of the twelve Cæſars, and portraits of Charles II., queen Anne, lord Maccleſfield, and the lords chancellors Cowper and Camden.—Barnard's Inn, ſituated near Fetter-lane, Holborn, and a dependent on Gray's Inn.—Serjeant's Inn, in Chancery-lane: it has a ſmall neat chapel, with ſeats for the judges.—Clifford's Inn, ſituated near St. Dunſtan's church, Fleet-ſtreet, and an appendage to the Inner Temple: in the hall is an oak caſe, of very great antiquity.—Clement's Inn, near St. Clement's church in the Strand, a dependent on the Inner Temple: it contains an elegant hall, and a garden kept with particular care, in which is a ſun-dial, ſupported by a kneeling figure of conſiderable merit, brought from Italy by lord Clare.—New Inn, adjoining to the laſt mentioned, and an appendage to the Middle Temple.—Lyon's Inn, ſituated in Wych Street, and belonging to the Inner Temple. For hiſtorical and deſcriptive particulars of theſe eſtabliſhments and buildings, the reader is referred to Dugdale's "Origines Juridiciales," folio, 1680; Herbert's "Antiquities of the Inns of Court and Chancery," 8vo. 1804; and Lane's "Student's Guide to Lincoln's Inn," 8vo.

General remarks.—Before cloſing this intereſting and important article, it ſeems proper to offer a very few remarks on the characteriſtic features of the metropolis, the manners and condition of its inhabitants, and the local peculiarities by which it is diſtinguiſhed. Such obſervations, however, the reader will readily perceive muſt be extremely general indeed. The ſubject is too various and comprehenſive to admit of full developement in a ſection, ſuch as the nature and limits of a work of this kind neceſſarily preſcribe.

The vaſt extent of London, and its immenſe population, cannot fail to ſtrike every viſitor with wonder and aſtoniſhment. Even to thoſe who have previouſly reſided in Paris, or in any other large city, theſe circumſtances alone muſt be matter of ſurpriſe; for not only is this city far more extenſive than the imperial metropolis, but it contains at leaſt 400,000 more perſons. Theſe, like the inhabitants of all great trading cities, are a heterogeneous maſs, compoſed of foreigners from every town and province of the united kingdoms, with a large portion of Jews, both native and foreign, Indians, Germans, French, Italians, Spaniards, Swiſs, and people of almoſt every nation in the world. From its immenſe trade, foreign and internal, a conſtant communication is kept up with every part of the globe, as well as with every part of our own dominions, both at home and abroad. The quantity of property of every deſcription flowing into the metropolis, and diſtributed from it, is immenſe. The number of ſtrangers conſtantly here, either on buſineſs or for pleaſure, is ſuppoſed to be not leſs than 100,000. Hence the prodigious concourſe of people in the ſtreets, and the number of carriages, carts, and other vehicles, continually crowding through them, are unparalleled in any city in the world.

London, in its uſual and more extenſive application, contains two cities, London and Weſtminſter, beſides the borough of Southwark. The city of Weſtminſter was formerly entirely detached from London, for the ſtreet now denominated the Strand was, at no very diſtant period, a ſort of bog, or moraſs, by which they were ſeparated. The monarchs of England have, for ſeveral centuries, fixed upon this city as their court reſidence, and the ſeat of the legiſlative and judicial authorities. This portion of modern London and its ſuburbs have extended with more rapidity than any other diſtrict of the town. Its buildings are in a much ſuperior ſtyle of architecture, and more open and regular in their diſtribution and arrangement, than thoſe in the city of London. They are chiefly inhabited by the nobility, gentry, and higher claſs of merchants, and though perhaps even inferior in external appearance to the reſidences of the nobles in ſome other countries, are no where ſurpaſſed in internal ſplendour and magnificence. London, within the walls, is the great repoſitory of the mercantile wealth, not merely of the metropolis, but of the whole country. Hence the buildings themſelves bear ample teſtimony to the object for which they were raiſed. Almoſt every houſe is a ſhop, or a counting-houſe, and ſo cloſely are they huddled together, that in many places room is ſcarcely left for the paſſage of a ſingle cart. Ground is valuable, and is fully occupied. This renders it certainly a matter of regret, and the remark is applicable to every part of the town, that there exiſt no regulations, or general plan authorized by act of parliament, to which all builders ſhould be obliged to conform. Such a plan, it is believed, was ſuggeſted by ſir Chriſtopher Wren after the great fire in 1666, and ſince by Gwynn, in a quarto volume, entitled "London and Weſtminſter improved, &c."

In a political point of view, London bears a moſt important ſway in deciding the opinions of the country at large. It is the centre from which all information, civil or military, emanates. The number of newſpapers and other political vehicles diſtributed here, and hence over the united kingdom, is prodigiouſly great. The foreigner who peruſes a few of theſe, cannot but be aſtoniſhed at the oppoſite ſentiments they contain, and the freedom with which they praiſe or cenſure the meaſures of government. This is the conſequence of liberty, and is doubtleſs one of its chief ſupports. The ruling magiſtrate of the kingdom is not exempt from public cenſure and critical animadverſion. At the commencement of the year 1812, this is more notorious than at any former period; and future hiſtorians will have occaſion to explain the cauſe and lament the effect. Not only has London a powerful influence over the political ſentiments of the country, but it has likewiſe no inconſiderable ſhare in directing the conduct of the higher powers. This it effects in ſome degree by the members it returns to parliament, which are ſix in number, but much more by the influence and riches of ſome of its chartered companies, as well as individuals. The bank of England, moſtly a body of merchants, is cloſely identified with government. The miniſter is compelled to have recourſe to the citizens for ſupplying the deficiences in the revenue, by loan, all which circumſtances render it neceſſary for the government to pay peculiar attention to the intereſts of the city in general.

London may further be characterized as the grand theatre for the diſplay of talents either in the arts or ſciences. It is here alone, perhaps, of all the cities in the united kingdom, that literary ability will receive any adequate reward. The artiſt of genius will likewiſe in general meet here with ſupport and encouragement. He will here find the fineſt productions of the moſt celebrated maſters in every department of art, by the ſtudy of which alone it is poſſible for him to attain the praiſe of excellence. In London are to be ſeen the beſt actors, and the moſt ſplendid theatres, Great Britain can boaſt of. The talents of the vocal and inſtrumental performers at the opera and concerts are unrivalled, and probably no city in Europe poſſeſſes a place of public amuſement more brilliant and magnificent than Vauxhall. London likewiſe abounds with muſeums, alſo various ſcientific, literary, and rational eſtabliſhments.

The merchants, bankers, and higher claſſes of tradeſmen, bear a ſtrong reſemblance in manners to the gentry with whom, from their immenſe wealth, they are generally accuſtomed to aſſociate. The ſame wealth, and the greater ſecurity they poſſeſs for its enjoyment than the merchants of other countries, confer upon them a ſpirit of real independence, to which the latter are totally ſtrangers. From this ſpirit of independence many advantages have undoubtedly ariſen both to the political condition and commercial proſperity of England. Reacting as it were upon the ſprings of our free conſtitution, from which it proceeds, it tends to render them vigorous and effective. Britons juſtly boaſt of their trial by jury as the bulwark of their freedom, but of what uſe would juries be, if the individuals who compoſe them were dependent and ſubmiſſive. It is to the ſpirit of the people rather than to any particular forms of adminiſtration that a country is indebted for its freedom.

The nobility and gentry of London are of a very different complexion from the ſame claſſes in other countries. They poſſeſs the higheſt poliſh of manners, but unite with their accompliſhments a degree of manlineſs and moderation, the reſult of the freedom of the Engliſh conſtitution and the general diffuſion of riches. A foreign nobleman conſiders himſelf as a diſtinct ſpecies of being from thoſe who are his inferior in rank and ſtation, and conſequently treats them with arrogance and contempt. An Engliſh nobleman, on the other hand, while ſufficiently conſcious of his own ſuperiority, behaves towards thoſe whom fortune has placed beneath him with real attention and civility; even in the article of dreſs he is ſcarcely to be diſtinguiſhed from the ordinary tradeſman or mechanic, while the higher claſs of merchants fully equals him in the ſplendour of his equipages and eſtabliſhments. He is almoſt wholly a ſtranger to that indolence which uſually reſults from exceſſive wealth and hereditary titles. Even the ladies of high rank are much leſs enervated and feeble than moſt of the ſame claſs abroad. They are accuſtomed to much exerciſe, and to mix in the public world.

The beneficial operation of this ſpirit on our commerce is the conſequence of that honour and integrity, which are uniformly found to accompany elevation of mind. That honeſty is the beſt policy, has long been an undiſputed dogma in commercial tranſactions in London. Hence it is that an Engliſh merchant can often obtain credit even in foreign countries, where it is little practiſed, and bills of immenſe value are ſometimes entruſted to him without receipt or acknowledgment. But theſe remarks ought not to be conſidered as applicable to the higher orders of traders only. The ſame freedom of conduct and ſterling integrity are prominent features in the character of the generality of eſtabliſhed ſhop-keepers, particularly thoſe of the city.

With reſpect to phyſicians, ſurgeons, and barriſters, they may be ranked with the gentry, though influenced by ſome little peculiarity of habits and manners. Apothecaries and attornies may be claſſed with the better ſort of ſhop-keepers.

The labouring claſſes in London are uſually of induſtrious and frugal habits. Their dreſs and appearance are far more decent and reſpectable than in any other city in the world, and this alone is a ſufficient evidence of its great trade and wealth. The ſame thing may be ſaid of the poorer ſort of ſhop-keepers, who, from the rate of their earnings, may be placed in the rank of labouring people. Male and female ſervants, in plain and honeſt families, may likewiſe be thrown into this rank with a ſimilar character.

Among many eſſential improvements recently made in London, the following are worthy of notice and commendation. In the city, and at the eaſt end of the town, we find that new docks have been made on a vaſt ſcale, whereby the property of merchants, companies, and the government is, and will be, materially benefited. Many commodious ſtreets and new houſes have alſo been made in the vicinity of thoſe docks, ſo that from the Tower to Limehouſe a new town has been formed. All the great roads leading to London have been much improved, and every approach to the metropolis, excepting that through the Borough, is broad, good, and flanked by handſome rows of houſes, or detached villas. In the city, and immediately adjacent, a wide and handſome ſtreet, called Skinner-ſtreet, has been entirely new built; a handſome ſquare formed in Moorfields, other ſtreets made near Temple Bar, ſeveral new buildings erected around the Bank, and others on Tower-hill. In Mary-le-bone a new plan is executing of laying out a large park into various allotments of detached villas, with gardens and pleaſure grounds, by John Naſh, eſq. architect. The deſtruction of the two great theatres by fire has afforded opportunities for much improvement, and much has been effected. North of Holborn many new ſquares and ſtreets have been built, the greater part of which has been deſigned by James Burton, eſq. In ſubſequent accounts of MARY-LE-BONE, PADDINGTON, and WESTMINSTER, many other ſubjects will be deſcribed.

Publications relating to London and Weſtminſter.—Though many volumes have been expreſsly devoted to the hiſtory and topography of the metropolis, it is generally admitted, and much to be regretted, that not one work is ſatisfactory either as a comprehenſive hiſtory, or popular and general deſcription. The moſt elaborate, and the moſt complete at the time of publication, is Strype's edition of Stow's “Survey of London,” 2 vols. folio, ſixth edition, 1754: but this is merely a reprint of a former edition of 1720. As a ſort of guide, or popular account of the preſent metropolis, “The Picture of London for 1812,” called “the thirteenth edition,” is beſt adapted to furniſh a ſtranger with a view of London ‘as it is’: but this, though admirably planned, and well executed in parts, is replete with errors of names, dates, and events. Many of its ſtrictures are objectionable on points of art, taſte, and antiquities; and one ſection on reviews and literary criticiſm is unjuſt, and of injurious tendency. The moſt eſſential points of theſe two works, with much additional information, will be compriſed in Brayley's “London and Middleſex; or, An hiſtorical, commercial, and deſcriptive Survey of the Metropolis of Great Britain,” now in the progreſs of publication, and promiſed to be completed in two large octavo volumes. The following are the titles of the other principal works relating to the topography of the metropolis.

“The Hiſtory of London, from its Foundation by the Romans, to the preſent Time,” by William Maitland, F.R.S. and others, 2 vols. folio, 1765.

“A new and complete Hiſtory and Survey of the Cities of London and Weſtminſter, the Borough of Southwark, and Parts adjacent,” to the year 1770, by Henry Chamberlain, eſq. and a ſociety of gentlemen.

“A new Hiſtory of London, including Weſtminſter and Southwark,” by John Noorthouck, citizen and ſtationer, 4to. 1773.

“Repertorium Eccleſiaſticum,” by —— Newcourt, 2 vols. folio. 1708.

“Londinopolis, or An hiſtorical Diſcourſe of the City of London,” by Howell, folio, 1657.

“A pictureſque Tour through the Cities of London and Weſtminſter,” by Thomas Malton, folio, 1792.

“Londinium Redivivum, or An ancient Hiſtory and modern Deſcription of London,” by James Peller Malcolm, F.S.A. 4 vols. 4to. 1807.

“Some Account of London,” by Thomas Pennant, eſq. 4th edition, 4to. 1805.

“The Cuſtoms of London, otherwiſe called Arnold's Chronicle,” new edit. 4to. 1811.

“London; being an accurate Hiſtory and Deſcription of the Britiſh Metropolis, and its Neighbourhood,” 6 vols. 8vo. ſaid to be by David Hughſon; but really compiled and written by David Pugh. This mode of giving fictitious names is very reprehenſible.

“London and Weſtminſter improved, with a Diſcourſe on public Magnificence,” by John Gwynn, 4to. 1766.

“A critical Review of the public Buildings, Statues, and Ornaments, in and about London and Weſtminſter,” by —— Ralph, architect, a new edition, 12mo. 1783.

“A Treatiſe on the Police of the Metropolis; containing a Detail of the various Crimes and Miſdemeanors by which public and private Property and Security are injured; and ſuggeſting Remedies for their Prevention,” by P. Colquhoun, L.L.D. 8vo. Several editions have been publiſhed.

“A Treatiſe on the Commerce and Police of the River Thames; containing an hiſtorical View of the Trade of the Port of London, and ſuggeſting Means for preventing Depredations thereon, &c. With a Map of the River from London Bridge to Sheerneſs,” by P. Colquhoun, L.L.D. 8vo.

“A Treatiſe on the Functions and Duties of a Conſtable; containing intereſting Details and Obſervations, relative to the Corruptions of Morals, and the Protection of the peaceful Subjects againſt penal Offences,” by P. Colquhoun, L.L.D. 8vo.

“The Thames; or, Graphic Illuſtrations of the Seats, Villas, &c. on the Banks of that River,” 2 vols. 8vo. 1811, chiefly a book of prints.

“The Hiſtory of London and its Environs,” 2 vols. 4to. publiſhed by John Stockdale.

It appears from Mr. Kirwan's “Eſtimate of the Temperature of different Latitudes,” that from a mean of the obſervations made at the houſe of the Royal Society, from the year 1772 to 1780, the annual temperature of London is 51°.9, or in round numbers 52°; the monthly temperature is ſtated in the following table:

	°		°
January -	35.9	July -	66.3
February -	42.3	Auguſt -	65.85
March -	46.4	September -	59.63
April -	49.9	October -	52.81
May -	56.61	November -	44.44
June -	63.22	December -	41.04

The greateſt uſual cold is 20°, and happens in January; the greateſt uſual heat is 81°, and happens generally in July. The limits of the annual variation are 2°.5, that is, 1° above and 1°.5 below the mean.

The greateſt variations of the mean temperature of the ſame month, in different years, are as follows:

	°		°
January -	6	July -	2
February -	5	Auguſt -	2
March -	4	September -	3.5
April -	3	October -	4
May -	2.5	November -	4
June -	2	December -	3

Hence it appears that the ſummers differ much leſs than the winters.

The moſt uſual variations of temperature within the ſpace of 24 hours in every month, are

January	6°	July	10°
February	8	Auguſt	15
March	20	September	18
April	18	October	14
May	14	November	9
June	12	December	6

Hence is ſeen the origin of vernal and autumnal colds.

Mr. Kirwan has ſhewn that, proportionably to its latitude, it is much colder in London than at Edinburgh; for the mean temperature of Edinburgh in January is 34° 5, and that of London is 35°.9; and this difference he aſcribes to the following cauſes: 1ſt. That Edinburgh is not expoſed to the Siberian winds as London is. 2dly. That Edinburgh is nearer to the ſea. 3dly. The rigour of the northerly winds is very little moderated, if not increaſed, in paſſing from Scotland to us, particularly if the ſurface of the earth is covered with ſnow; and hence, if we believe Dr. Smollet (Travels to Italy), the winters are ſometimes milder at Edinburgh than at London.

London, a town of America, in Ann-Arundel county, Maryland; 5 miles S.W. of Annapolis.

London, *The townſhip of*, is ſituated in Upper Canada, on the main fork of the river Thames, is a central poſition from the lakes Erie, Huron, and Ontario, and offers many advantages for being the capital of the province. It communicates with lake St. Clair and the Detroit by the river Thames; with lake Huron by the northern branch of the Thames and a ſmall portage, and with the Ouſe and lake Ontario by the military way called Dundas-ſtreet. It abounds with black and white walnut, cherry, baſs, elm, hickory, beech, aſh, and many other kinds of timber. It is ſupplied with excellent water, and the ſituation is healthy.

London *Cove*, a narrow water of Long iſland ſound, which ſets N. into the townſhip of New London; 4 miles W. of the mouth of Thames river.

London *Harbour*, a bay and harbour on the N. coaſt of the iſland of St. John, in the gulf of St. Lawrence. N. lat. 46° 26′. W. long. 67° 8′.

London, *New*. See New *London*.

London *Pride*, in *Gardening*, the name of a well-known plant of the flower-kind. See Saxifraga.

LONDONDERRY, in *Geography*, a county of Ireland, in the province of Ulſter. It lies to the weſt of Antrim, from which it is in a great meaſure ſeparated by the river Bann. Lough Neagh waſhes it on the ſouth-eaſt; on the ſouth it has Tyrone, from which it is ſeparated, in part, by the little river Ballinderry; on the weſt it has Donegal and Lough Foyle; and on the north, that part of the Atlantic ocean which is ſometimes called the Deucaledonian ſea. A great part of it was given by James I. to the twelve London companies, on condition of their fortifying the towns of Derry and Coleraine. From this circumſtance, both the county and town were called by the name of Londonderry. It extends 32 Iriſh miles from north to ſouth, and about the ſame from eaſt to weſt, where it is broadeſt. This length and breadth are equal to 40½ Engliſh miles. It meaſures in area 318,500 Iriſh acres, and 479 ſquare miles, which, in Engliſh meaſure, are 511,688 acres, and 798 ſquare miles. It contains 31 pariſhes, which have 29 churches, moſtly in the dioceſe of *Derry*; which ſee.

Londonderry is in general very mountainous, excepting the eaſtern part, adjoining Lough Neagh and the river Bann. The principal hills are Benyevenagh in the north; Sliebh-Gallen in the ſouth; Cairntogher, which ſometimes gives name to the chain extending into the county of Tyrone, and Sawell on the borders of the ſame county. The higheſt of theſe, however, is not more than 1600 feet above the level of the ſea. The face of the country, near the ſea and the river Bann, bears a great reſemblance to that of the adjoining county of Antrim. Baſaltes, intermixed with zeolite, is found on a bed of white limeſtone, which is ſometimes concealed by the baſaltes, and ſometimes ſhows itſelf in ſteep and elevated rocks, eſpecially in Benyevenagh, and the adjacent forelands. The ground about Lough Foyle is, in general, a ſtrong loam, which is well adapted for wheat, barley, flax, and potatoes, and which is principally manured by the ſhells procured from the lough. The land in the vallies does not conſiderably differ, except in manure, ſhells being at too great a diſtance; a circumſtance which is, in ſome meaſure, recompenſed by the depoſits from the mountain torrents. The river Roe, which paſſes through the middle of the county to Lough Foyle, is thought to ſeparate the baſaltic region from the ſchiſtoſe, or ſlaty. There are in the latter various kinds of ſchiſt; and with them are found pudding ſtone, gneiſs, and blue limeſtone. Sandſtone is found univerſally under the baſaltes, and occaſionally intermingled with ſchiſt. Iron is in great abundance throughout the county, either in an ochreous ſtate, or mixed with manganeſe. It was formerly ſmelted by an agent of the Drapers' company, but the ſpeculation was unſucceſsful. Boate mentions gold found in Londonderry; and ſome ſpecimens of quartz containing thin leaves of gold are ſaid to have been lately met with (A.D. 1802); they were found on the ſurface, and ſuppoſed to be adventitious. The ſiliceous, or flinty matter, like the calcareous, has two diſtinct appearances, which denote the regions of which they are the natives. The ſilica in the ſchiſt country is in the character of quartz, and the lime of the ſame country is blueiſh and laminated. In the baſaltic country the ſilica is in the character of flint, including chalcedony, &c.; and the lime white, and abounding in marine ſubſtances. Both the quartz and flint are of various tinges. The former ſometimes clear, yellow, browniſh, reddiſh, &c.; the latter horn-coloured, purple, browniſh black, &c. The flint has ſometimes marine impreſſions; the quartz never. Rock cryſtals of great hardneſs, and weighing from one ounce to twelve, are found in the ſchiſtoſe region. The graſs which is moſt prevalent in this county is the Agroſtis ſtolonifera, called in Iriſh *fiorin*, and ſo ſtrongly recommended for cultivation by Dr. Richardſon. It is peculiarly luxuriant in low meadows. The ſoft meadow graſs (Holcus mollis), is thought to be next in value and predominance, and is that generally ſown. The variety, however, found in other counties, is not wanting in this. Of other vegetables, the moſt remarkable is the Lichen lomphaloides, which, when manufactured, is called litmus, turnſole, and archil. This is found on the rocks in great abundance, and is uſed both for dyeing purple, and in a ſimple watery decoction, for giving woollen goods, ſuch as flannels, an orange-red colour. The flats near the river Bann have a greater extent of bog than is at preſent neceſſary for fuel, which bog is in general very reclaimable. Both this part of the county and the mountainous diſtrict require much improvement. Some young cattle are reared on the mountains, and ſome ſheep fed.

The linen manufacture is carried on extenſively through every part of the county. Londonderry is well watered by ſeveral ſtreams. Of theſe the Bann flows from Lough Neagh, and forms the eaſtern boundary, till it approaches the town of Coleraine, when it ceaſes to be a boundary, flowing through the liberties of that town into the ſea about three miles below it. About a mile above Coleraine is a ridge of rocks called the Salmon Leap, at which weirs are built for the ſalmon-fiſhery. Great quantities of this fiſh are caught in the Bann, and being ſalted at Coleraine form a valuable article of commerce. There is alſo an eel-fiſhery at Toome, between Lough Beg and Lough Neagh, which, as well as the other, is very valuable to the proprietor. The Foyle, a wide and deep river, having divided the counties of Tyrone and Donegal, and received ſeveral ſmaller, enters this county a little above the city of Londonderry, and paſſing by it expands into that large ſaltwater lake, known by the name of Lough Foyle. The rivers Fahan and Roe riſing in the Cairntogher mountains alſo flow into this lough. Several other ſtreams join the Bann in its courſe, or increaſe the waters of Lough Neagh; amongſt the latter is the Moyowla. In tracing the coaſt from the little harbour of Portruſh, in Antrim, we firſt meet with Bannhaven at the mouth of the Bann, about three miles from which is the town of Coleraine. (See Coleraine.) Proceeding along the coaſt, Magilligan Point, at the extremity of a large ſandy tract, preſents itſelf, approaching the coaſt of Donegal, and thus forming the entrance of Lough Foyle. Between Benyevanagh mountain and this point is a warren, which yields, on an average, three thouſand dozen of rabbits each year. The ſale of the ſkins, which are ſent to Dublin, produces a large revenue to the proprietor. Near this point is the Tons, a ſand-bank not far from the entrance of the lough, on which the ſea ſometimes beats with a prodigious noiſe. The entrance of Lough Foyle is not above half a mile wide, ſo that it is land-locked on all ſides. It is a large oval baſin, twelve miles long, and near ſeven broad in the wideſt part, but it has only one deep channel in the middle between long ſhoals or banks of ſand. It is, nevertheleſs, on the whole, a ſafe, large, and commodious harbour. Near the mouth of the river Roe, which runs into the lough, is a ridge of ſtones mixed with ſhells and ſand, extending a mile and a half in length, which is called the Giant's Grave. There are other banks of the ſame kind at a greater diſtance from the lough, which renders it probable, that this part of the county was once overflowed by the ſea. The county town, called alſo Londonderry, is on the Foyle. (See next article.) Other towns are, Newtown Limavaddy, Magherafelt, and Moneymore. Londonderry returns three members, two for the county and one for the city. Sampſon's Statiſtical Survey, and Beaufort's Memoir.

Londonderry, the capital of the county deſcribed in the preceding article: it is on the river Foyle, over which it has a wooden bridge, 1068 feet in length, and of ſingular and excellent conſtruction. It is a well built and neat city, and has a general appearance of order, induſtry, and ſobriety. It contains about 10,000 inhabitants. Its trade is conſiderable, eſpecially with America; the exports are linen, linen-yarn, &c. In the time of queen Elizabeth, Derry was a conſiderable military ſtation, being well fitted for keeping the adjoining country in ſubjection. In the reign of James I. it was rebuilt and ſtrengthened by the citizens of London, to whom it was given by that monarch. In the rebellion of 1641, and the ſucceeding years, it was twice beſieged, but without ſucceſs; but it is moſt celebrated in hiſtory for the ſiege nobly ſuſtained by the inhabitants in 1688 and 1689, for 105 days againſt the army of king James, although preſſed by a very ſevere famine. It deſerves to be recorded, that when the military governor was inclined to give up further reſiſtance, the inhabitants, inſtigated by the Rev. George Walker, whom they choſe governor, took it upon themſelves, and have thus gained immortal renown. Londonderry is ſtill ſurrounded by walls and has a military governor, who is alſo commander of Culmore fort. (See Culmore.) Londondery is a poſt-town, and returns a member to parliament. It is 115 miles N. by W. from Dublin. N. lat. 55°. W. long. 7° 13′. Sampſon, &c.

Londonderry, a poſt-town of America, in Rockingham county, New Hampſhire, near the head of Beaver river, which diſcharges itſelf into Merrimack river, at Pawtucket Falls, ſettled in 1718, incorporated in 1722, and containing 2650 inhabitants. The inhabitants are moſtly the deſcendants of emigrants from Ulſter county, Ireland, and are employed in the manufacture of linen cloth and thread; 36 miles S.W. by S. from Portſmouth.—Alſo, a townſhip in Halifax county, Nova Scotia, on the N. ſide of Cobequid or Colcheſter river, about 30 miles from its mouth, at the baſin of Minas; ſettled by North Iriſh and Scotch.—Alſo, a townſhip in the N.W. part of Windham city, Vermont, on the head waters of Weſt river, about 33 miles N.E. of Bennington. In 1795 it was divided into two parts, the E. half being called *Windham*, and the W. part retaining its original name.—Alſo, two townſhips in Pennſylvania; one in Dauphin county, containing 1577 inhabitants, the other in Somerſet county, having 709 inhabitants.

LONDONGROVE, a townſhip in Cheſter county, Pennſylvania, containing 921 inhabitants.

LONDRES, or London, a town of South America, in the province of Tucuman, built by Tarita, the governor, in 1555, in compliment to Mary, queen of England, then married to Philip, king of Spain. S. lat. 19° 12′.

LONEE, a town of Hindooſtan; 12 miles E.S.E. of Poonah.

LONEL, a town of the iſland of Sardinia; 22 miles S.E. of Boſa.

LONER, a town of Hindooſtan, in Baglana; 16 miles N.W. of Chander.

LONERSTATT, a town of Bavaria; 14 miles S.S.W. of Bamberg.

LONG, James le, in *Biography*, a learned French prieſt, was born at Paris in 1665. In 1686 he entered into the congregation of the Oratory, and occupied the poſt of profeſſor in ſeveral houſes of that ſociety, and finally was appointed their librarian at St. Honorè. He paſſed his life in learned labours, and died in 1721, with the character of a virtuous and eſtimable man. He was thoroughly converſant in the ancient and many of the modern languages, and had an extenſive acquaintance with the hiſtory of literature, of bibliography, and printing. His chief work is entitled “Bibliotheca Sacra,” containing a catalogue of all the editions and tranſlations of the ſcriptures, in two volumes octavo, to which he ſubjoined, in a ſecond part, a liſt of all the authors who had written upon the ſcriptures. He publiſhed, likewiſe, “Bibliotheque Hiſtorique de la France,” being an account of all the hiſtorical works relative to that country, which is highly eſteemed, and ranks among the great productions of the reign of Lewis XV.; alſo a “Hiſtorical Diſcourſe on Polyglott Bibles,” and their ſeveral editions.

Long, Roger, an Engliſh divine, and aſtronomical profeſſor, was born in 1679, received his college education at Cambridge, and became maſter of Pembroke-hall, and Lowndes's profeſſor of aſtronomy. He is chiefly known as an author, by a Treatiſe on Aſtronomy, in two volumes; the firſt of which was publiſhed in 1742, and the ſecond in 1764. He was the inventor of a curious aſtronomical machine, erected in a room at Pembroke-hall. This is a hollow ſphere about eighteen feet in diameter, in which thirty perſons may ſit. The concave ſurface repreſents the heavens with the ſtars and conſtellations in their order; the axis is placed parallel to the axis of the world, upon which it is eaſily turned by a winch. (See Constellation.) He publiſhed a Commencement Sermon, and an Anſwer to Dr. Galley's pamphlet "On Greek Accents." He died in the year 1770, at the age of eighty-one.

Long, Thomas, a learned divine, was born at Exeter in 1621, and educated at the college of that name in Oxford. His higheſt preferment in the church was a prebend in Exeter cathedral, of which he was deprived at the Revolution for refuſing the oaths. He died in 1700. He was author of many theological pieces; of a Life of Julian; Hiſtory of all the Popiſh and Fanatical Plots and Conſpiracies; and a Vindication of the Claim of King Charles I. to the Authorſhip of the Eikon Baſilike.

Long *Accent.* See Accent.

Long *Bay*, in *Geography*, a bay on the E. coaſt of Jamaica. N. lat. 18° 8′. W. long. 76′.—Alſo, a bay on the W. coaſt of the iſland. N. lat. 18° 20′. W. long. 78° 21′.—Alſo, a bay on the S. coaſt of the ſame iſland; ſix miles E. of Callibaſh bay.—Alſo, a bay of America, extending along the ſhore of N. and S. Carolina, from Cape Fear to the mouth of Pedee river.—Alſo, a bay on the W. ſide of the iſland of Barbadoes.—Alſo, another on the S. ſide of the iſland.

Long *Boat*, the largeſt and ſtrongeſt boat belonging to a ſhip. See Boat.

Long *Hand.* See *Long* Hand.

Long-*horned Cattle*, in *Agriculture*, a breed of neat cattle, which is chiefly diſtinguiſhed by the length of the horn, the thickneſs and firm texture of the hide, the length and cloſeneſs of the hair, the large ſize of the hoof, and the coarſe leathery thickneſs of the neck. It is ſometimes termed Lancaſhire breed from its being predominant there. See Cattle.

Long-*jointed*, in the *Manege.* A horſe is ſaid to be long-jointed, whoſe paſtern is ſlender and pliant. Long-jointed horſes are wont to have wind-galls.

Long *Iſland*, in *Geography*, an iſland in Penobſcot bay. (See Isleborough.)—Alſo, an iſland of America, on the coaſt of Main, 4 miles long and 1½ wide. N. lat. 44° 20′. W. long. 68° 20′.—Alſo, an iſland near the S. coaſt of Jamaica. N. lat. 17° 51′. W. long. 76° 58′.—Alſo, an iſland near the N. coaſt of the iſland of Antigua. N. lat. 17° 17′. W. long. 61° 28′.—Alſo, an iſland in Hudſon's Straits. N. lat. 61°. W. long. 75°.—Alſo, another in Hudſon's bay. N. lat 55° 16′. W. long. 78° 30′.—Alſo, a narrow iſland about two miles in length, on the S. coaſt of the county of Cork, Ireland, in Roaring-water bay. It contains 316 acres of land. N. lat. 51° 26′. W. long. 9° 27′.—Alſo, one of the ſmaller Bermuda iſlands.—Alſo, a ſmall iſland in the gulf of Mexico, near the coaſt of Eaſt Florida. N. lat. 27° 50′. W. long. 82° 55′.—Alſo, a ſmall iſland near the coaſt of S. Carolina. N. lat. 32° 50′. W. long. 79° 45′.—Alſo, a ſmall iſland near the coaſt of Virginia, at the mouth of York river. N. lat. 37° 16′. W. long. 76° 35′.—Alſo, a ſmall iſland in the Atlantic, near the coaſt of Braſil. S. lat. 16° 30′.—Alſo, an iſland of America, formerly called "Manhattan," afterwards "Naſſau iſland," diſcovered by Henry Hudſon, an Engliſhman, in 1609, and belonging to the ſtate of New York. It extends from Hudſon river, oppoſite to Staten iſland, almoſt to the weſtern boundaries of the coaſt of Rhode iſland, terminating with Montauk point. Its length is about 140 miles, and its medial breadth from 10 to 14 miles; and it is ſeparated from Connecticut by "Long iſland Sound." It contains 1400 ſquare miles, and is divided into three counties, *viz.* King's, Queen's, and Suffolk; and theſe are again ſubdivided into 19 townſhips. The N. ſide of the iſland is rough and hilly, but the ſoil is well adapted for raiſing grain, hay, and fruit. The S. ſide of the iſland lies low, and its ſoil is light and ſandy. On the ſea-coaſt are extenſive tracts of ſalt-meadow, which extend from Southampton to the W. end of the iſland. Nevertheleſs, the ſoil is well adapted to the culture of grain, eſpecially Indian corn. Near the middle of the iſland is Hampſtead plain, in Queen's county, which is 16 miles long, and about eight broad. This plain, the ſoil of which is black, and apparently rich, yields naturally a particular kind of wild graſs and a few ſhrubs; but it produces ſome rye, and furniſhes, together with the ſalt marſhes, food for large herds of cattle. On the E. part of the iſland, E. of Hampſtead plain, is a large barren heath, called Bruſhy plain, overgrown with ſhrub oak, intermixed with a few pine-trees, which afford harbour to wild deer and grouſe. In a bay on the S. ſide of the iſland, vaſt quantities of oyſters are taken, and alſo of baſs. The largeſt river in the iſland is Peakonok, which is but an inconſiderable ſtream; it runs E. and diſcharges itſelf into a large bay that ſeparates Southhold from Southampton. In this bay are Robin and Shelter iſlands. Rockonkama pond lies about the centre of the iſland, between Smith-town and Iſlip; it is about a mile in circumference, and has been found to riſe gradually for ſeveral years, until it had arrived to a certain height, and then to fall more rapidly to its loweſt bed; and thus it is continually ebbing and flowing. Two miles to the ſouthward of the pond is a ſtream called Connecticut river, which runs into the bay. There are two whale-fiſheries; one from Soggharbour, which produces about 1000 barrels of oil annually. The other is much ſmaller, and is carried on by the inhabitants in the winter ſeaſon, from the S. ſide of the iſland. They commonly catch from three to ſeven whales in a ſeaſon, which produce from 25 to 40 barrels of oil each. This fiſhery was formerly a ſource of conſiderable wealth to the inhabitants, but on account of a ſcarcity of whales, it has of late years much declined. From Soggharbour to the Weſt Indies and other places, there is a conſiderable trade in whale oil, pitch, pine-boards, horſes, cattle, flax-feed, beef, &c. The produce of the middle and weſtern parts of the iſland is carried to New York. The iſland contains 42,097 inhabitants, of whom 3893 are ſlaves. (Morſe.)—Alſo, an iſland in Holſton river, Teneſſee, five miles long, and containing 2500 acres of rich land, ſubject to inundations. Many boats are built here annually, and loaded with the produce of the ſtate for New Orleans; 100 miles above Knoxville, and 1000 from the mouth of the Teneſſee.—Alſo, a ſmall iſland in the Eaſt Indian ſea, near the W. coaſt of Billiton. S. lat. 2° 51′. E. long. 107° 30′.—Alſo, a ſmall iſland near the S.E. coaſt of the iſland of Madeira. S. lat. 7° 16′. E. long. 113° 5′.—Alſo, a ſmall iſland near the N. coaſt of the iſland of Flores. S. lat. 8° 6′. E. long. 122° 27′.—Alſo, a ſmall iſland in a bay on the N. coaſt of New Guinea. S. lat. 1° 4′. E. long. 135° 18′.

18'.—Alſo, an iſland in Queen Charlotte's ſound, on the coaſt of New Zealand, called by the natives "Hamote," about four miles long; nine miles S. of Port Jackſon.—Alſo, an iſland in the South Pacific ocean, at the entrance of Broad ſound, on the N.N.E. coaſt of New Holland, about 30 miles in length. S. lat. 22° 24'. W. long. 210° 33'.—Alſo, an iſland diſcovered by captain Wallis in 1767, and ſo called by him. N. lat. 10° 20'. W. long. 247° 24'.—Alſo, a ſmall iſland near the W. coaſt of Scotland. N. lat. 56° 15'. W. long. 5° 37'.—Alſo, a ſmall iſland in the Eaſt Indian ſea, near the coaſt of Africa. S. lat. 10° 25'.—Alſo, one of the iſlands in the Mergui Archipelago. N. lat. 12° 36'. E. long. 98° 12'.

Long *Iſland Sound*, a kind of inland ſea, from three to 25 miles broad, and about 140 miles long, extending the whole length of Long iſland, in the ſtate of New York, and dividing it from Connecticut. This ſound communicates with the ocean at both ends of the iſland, and affords a very ſafe and convenient inland navigation.

Long *Iſle*, or *Iſle River*, *Indians*, are Indians who inhabit the territory, on Iſle, or White river, which runs W. into the Wabaſh river. The mouth of White river is in N. lat. 38° 58'. W. long. 90° 7'.

Long *Key*, *Middle*, a ſmall iſland in the bay of Honduras, near the coaſt of Mexico. N. lat. 17° 10'. W. long. 88° 48'.

Long *Key*, *North*, a ſmall iſland in the ſame bay. N. lat. 17° 58'. W. long. 88° 40'.

Long *Key*, *South*, a ſmall iſland in the ſame bay. N. lat. 16° 57'. W. long. 88° 50'.

Long *Konang*, a town of Corea; 125 miles S.S.E. of King-ki-tao. N. lat. 35° 55'. W. long. 79° 20'.

Long *Lakes*, *The*, a chain of ſmall lakes in Upper Canada, extending weſterly from the grand portage of lake Superior toward Rain lake.

Long *Legs*, in *Natural Hiſtory*. See Tipula.

Long *Meadow*, in *Geography*, a town of America, in Hampſhire county, Maſſachuſetts, on the E. bank of Connecticut river, about four miles S. of Springfield, and 23 N. of Hartford; incorporated in 1783, and containing a congregational church, and about 70 houſes, forming a ſtreet parallel with the river. The townſhip contains 973 inhabitants.

Long *Meaſure*. See Measure.

Long *Mountain*, in *Geography*, a mountain of Virginia; 80 miles W.S.W. of Richmond. N. lat. 37° 15'. W. long. 79° 20'.

Long *Noſe*, a cape on the E. coaſt of New Holland. S. lat. 35° 6'. E. long. 151° 15'.

Long *Point*, is a long beach or ſand bank, on lake Erie, in Upper Canada, now called the "North Foreland," ſtretching into lake Erie from the townſhip of Walſingham, and forming the deep bay of Long Point, upwards of 20 miles in length.

Long *Pond*. See Bridge-town.

Long *Reach*, a narrow part of the ſtraits of Magellan, between Cape Quod and Buckley Point.

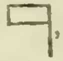
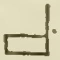
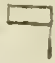
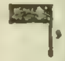
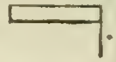
Long *Reef*, a ſhoal in the Spaniſh Main, near the Moſquito ſhore. N. lat. 12° 22'. W. long. 82° 50'.

Long *Saut*, a ſmall iſland of Upper Canada, in the river St. Lawrence, in front of the townſhip of Oſnabruck, containing from 1000 to 1500 acres, with good ſoil. N. lat. 55° 2'. W. long. 74° 55'.

Long *Shoal*, a river of America, in North Carolina, which runs into Pamlico ſound, at the mouth of which is a cape called *Long Shoal Point*. N. lat. 35° 22'. W. long. 76° 2'.

Long *Timbers*, or *Double Futtocks*, in a *Ship*, thoſe timbers afore and abaft the floors which extend from the deadwood to the run of the ſecond futtock head.

LONGA, in *Geography*, one of the ſmaller Shetland iſles. N. lat. 60° 12'. W. long. 1° 37'.—Alſo, a ſmall iſland near the W. coaſt of Scotland. N. lat. 56° 12'. W. long. 50° 40'.

Longa, Ital. *Longue*, Fr. *A long*, Engl. in *Muſic*, is a character for time in the firſt time-table, half the duration of the *maxima*, or *large*, and twice the length of the breve. The long is formed thus: , or . John de Muris and his contemporaries had longs of three ſeveral kinds; the *perfect*, with a tail on the right ſide, thus , or , equal to three pointed breves; it is called perfect, ſays de Muris, on account of its numerical ratio with the Trinity. The *imperfect* long is of the ſame figure as the perfect, and is only diſtinguiſhed by the mood or character for time at the beginning of a movement. It was accounted imperfect, from its being incomplete without a breve to precede or follow it. The *double* long contains two imperfect breves: it is like the long only of a much larger ſize . John de Muris quotes Ariſtotle to prove that this note is not uſed in canto fermo. At preſent, the term long is only correlative with *ſhort*, in ſcanning verſes.

LONGABOO, in *Geography*, one of the ſmaller Friendly iſlands; 12 miles E.S.E. of Naenava.

LONGARA, a town of Naples, in Calabria Ultra; 20 miles W.N.W. of Severina.

LONGARES, a town of Spain, in Aragon; 20 miles S.S.W. of Aragoſſa.

LONGAY, a ſmall iſland near the E. coaſt of Skye. N. lat. 57° 19'. W. long. 5° 53'.

LONGEAU, a town of France, in the department of the Upper Marne, and chief place of a canton, in the diſtrict of Langres; ſix miles S. of Langres. The place contains 438, and the canton 9485 inhabitants, on a territory of 295 kiliometres, in 29 communes.

LONGEPIERRE, Hilaire-Bernard de Roqueleyne, *Lord of*, in *Biography*, born of a noble family at Dijon, in 1659, was ſecretary of commands to the duke of Berry. He diſtinguiſhed himſelf by an accurate knowledge of the Greek language, and publiſhed notes upon Anacreon, Sappho, Bion, Moſchus, and the Idylls of Theocritus. In 1690 he gave the public a collection of "Idylls" of his own invention: he was author of the tragedies of "Medea," and "Electra," written after the manner of the Greek tragedians, which were brought on the ſtage, and gave him a reputation among dramatic poets. He wrote other tragedies of conſiderable merit, and died at Paris in 1721. Moreri.

Longepierre, in *Geography*, a town of France, in the department of the Saône and Loire, ſituated near the river Doubs; 16 miles N.E. of Chalons ſur Saône.

LONGERI, a town of Africa, in the kingdom of Loango, where the kings are generally interred.

LONGEVITY, a term expreſſing length of life.

From the different longevities of men in the beginning of the world, after the flood, and in theſe ages, Dr. Derham deduces a good argument for the interpoſition of a Divine

Providence. Immediately after the creation, when the world was to be peopled by one man and woman, the ordinary age was nine hundred years and upwards. Immediately after the flood, when there were three perſons to ſtock the world, their age was cut ſhorter; and none of thoſe patriarchs, but Shem, arrived at five hundred. In the ſecond century we find none that reached two hundred and forty, in the third, none, but Terah, that came to two hundred years; the world, at leaſt a part of it, by that time being ſo well peopled, that they had built cities, and were cantoned out into diſtant nations. (See Antediluvian.) By degrees, as the number of people increaſed, their longevity decreaſed, till it came down at length to ſeventy or eighty years; and there it ſtood, and has continued to ſtand, ever ſince the time of Moſes. This is found a good medium, and, by means hereof, the world is neither overſtocked, nor kept too thin; but life and death keep a tolerably equal pace. So that from this period the common duration of man's life has been much the ſame in all ages, as we learn both from ſacred and profane hiſtory. In conſequence of the reſearches of the ingenious Mr. Whitehurſt (ſee his Inquiry into the Origin of the Earth), and of Dr. Fothergill (ſee his Obſervations on Longevity in the Mancheſter Memoirs, vol. i.) we are enabled to preſent our readers with tables of longevity, and appropriate reflections, which will be no leſs inſtructive than amuſing.

Table I.

Names of the Perſons.	Ages.	Places of Abode.	Living or Dead.
Thomas Parre	152	Shropſhire	Died Nov. 16, 1635, Phil. Tran. N° 44.
Henry Jenkins	169	Yorkſhire	—— Dec. 8, 1760, Phil. Tran. N° 221.
Robert Montgomery	126	Yorkſhire	—— in 1670.
James Sands	140	Staffordſhire	Ditto Fuller's Worthies, p. 47.
His Wife	120	Staffordſhire	
Counteſs of Deſmond	140	Ireland	Rawleigh's Hiſtory, p. 166.
Counteſs of Ecleſton	143	Ireland	Died 1691 (a)
J. Sagar	112	Lancaſhire	—— 1668 (b)
—— Laurence	140	Scotland	Living (c)
Simon Sack	141	Trionia	Died May 30, 1764
Colonel Thomas Winſlow	146	Ireland	—— Auguſt 26, 1766
Francis Confiſt	150	Yorkſhire	—— January 1768
Chriſt. J. Drakenberg	146	Norway	—— June 24, 1770 (d)
Margaret Forſter	136	Cumberland	Both Living 1771
Her Daughter	104	Cumberland	
Francis Bons	121	France	Died February 6, 1769
John Brookey	134	Devonſhire	Living 1777 (e)
James Bowels	152	Killingworth	Died Auguſt 15, 1656 (f)
John Tice	125	Worceſterſhire	—— March 1774 (g)
John Mount	136	Scotland	—— February 27, 1776 (h)
A. Goldſmith	140	France	—— June 1776 (i)
Mary Yates	128	Shropſhire	—— 1776 (k)
John Bales	126	Northampton	—— April 5, 1706 (l)
William Ellis	130	Liverpool	—— Auguſt 16, 1780
Louiſſa Truxo, a Negreſs in South America	175	Tucuman, South America	Living October 5, 1780 (n)
Margaret Patten	138	Lockneugh, near Paiſley	Lynche's Guide to Health.
Janet Taylor	108	Fintray, Scotland	Died October 10, 1780
Richard Lloyd	133	Montgomery	Lynche's Guide to Health.
Suſannah Hilliar	100	Piddington, Northamptonſhire	Died February 19, 1781 (o)
James Hayley	112	Middlewich, Cheſhire	—— March 17, 1781 (p)
Ann Cockbolt	105	Stoke-Bruerne, Northamptonſhire	—— April 5, 1775 (q)

William Walker, aged 112, not mentioned above, who was a ſoldier at the battle of Edge-Hill.

(a) Fuller's Worthies, p. 140.

(b) Philoſophical Tranſactions, abridged by Lowthorp, vol. iii. p. 306.

(c) Derham's Phyſico Theology, p. 173.

(d) Annual Regiſter.

(e) Daily Advertiſer, Nov. 18, 1777.

(f) Warwickſhire.

(g) Daily Advertiſer, March 1774.

(h) Morning Poſt, Feb. 29, 1776.

(i) Daily Advertiſer, June 24, 1776.

(k) Ibidem, Auguſt 22, 1776.

(l) See Inſcription in the portico of All-Saints church.

(m) London Evening Poſt, Auguſt 22, 1780.

(n) London Chronicle, October 5, 1780.

(o) Northern Mercury, Feb. 19, 1781.

(p) General Evening Poſt, March 24, 1781.

(q) Well known to perſons of credit at Northampton.

If we look to an early period of the Chriſtian era, we ſhall find that Italy has been, at leaſt about that time, peculiarly propitious to longevity. Lord Bacon obſerves, that the year of our Lord 76, in the reign of Veſpaſian, was memorable; for in that year was a taxing, which afforded the moſt authentic method of knowing the ages of men. From it, there were found in that part of Italy, lying between the Apennine mountains and the river Po, one hundred and twenty-four perſons who either equalled or exceeded one hundred years of age, namely:

TABLE II.

	54 Perſons of	100 Years each.
	57	110
	2	125
	4	130
	4	136
	3	140
In Parma	3	120
	2	130
In Bruſſels	1	125 Years each.
In Placentia	1	131
In Faventia	1	132
	6	110
	4	120
In Rimino	1	150 *viz.* Marcus Aponius.

Mr. Carew, in his Survey of Cornwall, aſſures us, that it is no unuſual thing, with the inhabitants of that county, to reach ninety years of age, and upwards, and even to retain their ſtrength of body and perfect uſe of their ſenſes. Beſides Brown, the Corniſh beggar, who lived to one hundred and twenty, and one Polezew to one hundred and thirty years of age; he remembered the deceaſe of four perſons in his own pariſh, the ſum of whoſe years, taken collectively, amounted to three hundred and forty. Now, although longevity evidently prevails more in certain diſtricts than in others, yet it is, by no means, confined to any particular nation or climate; nor are there wanting inſtances of it, in almoſt every quarter of the globe, as appears from the preceding, as well as the ſubſequent table.

TABLE III.

Names of the Perſons.	Ages.	Places of Abode.	Where recorded.
Hippocrates, phyſician	104	Iſland of Cos	Lynche on Health, chap. 3.
Democritus, philoſopher	109	Abdera	Bacon's Hiſtory, 1095.
Galen, phyſician	140	Pergamus	Voſſ. Inſt. or lib. i.
Albuna Marc	150	Ethiopia	Hakewell's Appendix, lib. i.
Dumitur Raduly	140	Haromſzeek Traſilvania	Died January 18, 1782, General Gazetteer, April 18th.
Titus Fullonius	150	Bononia	Fulgoſus, lib. viii.
Abraham Paiba	142	Charles-Town, South Carolina	General Gazetteer
L. Tertulla	137	Arminium	Fulgoſus, lib. viii.
Lewis Cornaro	100	Venice	Bacon's Hiſtory of Life, &c. p. 134.
Robert Blakeney, Eſq.	114	Armagh, Ireland	General Gazetteer.
Margaret Scott	125	Dalkeith, Scotland	See Inſcription on her Tomb in Dalkeith Church-yard.
W. Gulſtone	140	Ireland	Fuller's Worthies.
J. Bright	105	Ludlow	Lynche on Health.
William Poſtell	120	France	Bacon's Hiſtory, p. 134.
Jane Reeves	103	Eſſex	St. James's Chronicle, June 14, 1781.
W. Paulet, marquis of Wincheſter	106	Hampſhire	Baker's Chronicle, p. 502.
John Wilſon	116	Suffolk	General Gazetteer, Oct. 29, 1722.
Patrick Wian	115	Leſbury, Northumberland	Plempius Fundammed, ſect. 4, chap. 8.
M. Laurence	140	Orcades	Buchanan's Hiſtory of Scotland.
Evan Williams	135	Caermarthen Workhouſe	General Gazetteer, October 12, 1782.

If we aſcend to the firſt ages of the world, and endeavour to inveſtigate the cauſes of the longevity of the antediluvians, we ſhall find that different writers have ſtated them very variouſly. Some have imputed it to the ſobriety of the antediluvians, and the ſimplicity of their manners; alleging that they abſtained from fleſh, and had none of thoſe excitements to gluttony, which have been deviſed in ſubſequent times. Others have aſcribed their longevity to the excellency of their fruits, and ſome peculiar virtues in the herbs and plants of thoſe days. Others again have thought that the long lives of the inhabitants of the old world proceeded from the ſtrength of their ſtamina, or firſt principles of their bodily conſtitutions; and this might be a concurrent, though not the ſole and adequate cauſe of their longevity: for Shem, who was born before the deluge, and had all the virtue of the antediluvian conſtitution, fell 300 years ſhort of the age of his forefathers, becauſe the greateſt part of his life was paſſed after the flood. It has therefore been more rationally ſuppoſed, that the chief cauſe of their longevity was the ſalubrity of the antediluvian air; which, after the deluge, became corrupted and unwholeſome. But how the flood ſhould occaſion this change in the air, it is not eaſy to comprehend; and the difficulty muſt remain unſolved, and we muſt content ourſelves with aſcribing it to the conſtitution of Providence, operating by unknown cauſes. The examples which are exhibited in the above tables are abundantly ſufficient to prove, that longevity, in more modern times, does not depend ſo much as ſome have ſuppoſed, on any particular climate, ſituation, or occupation in life. For we ſee that it often prevails in places, where all theſe are extremely diſſimilar; and it would, moreover, be very difficult, in the hiſtories of the ſeveral perſons above mentioned, to find any circumſtance common to them all, except perhaps that of being born of healthy parents, and of being inured to daily labour, temperance, and ſimplicity of diet. Among the inferior ranks of mankind, therefore, rather than amongſt the ſons of eaſe and luxury, ſhall we find the moſt numerous inſtances of longevity; even frequently, when other external circumſtances ſeem extremely unfavourable: as in the caſe of the poor ſexton at Peterborough, who, notwithſtanding his unpromiſing occupation among dead bodies, lived long enough to bury two crowned heads, and to ſurvive two complete generations. The livelihood of Henry Jenkins and old Parr is ſaid to have conſiſted chiefly of the coarſeſt fare, as they depended on precarious alms. To which may be added, the remarkable inſtance of Agnes Milburne, who, after bringing forth a numerous offspring, and being obliged, through extreme indigence, to paſs the latter part of her life in St. Luke's work-houſe, yet reached her hundredth and ſixth year, in that ſordid, unfriendly ſituation. The plain diet, and invigorating employments of a country life, are acknowledged, on all hands, to be highly conducive to health and longevity; while the luxury and refinements of large cities are allowed to be equally deſtructive to the human ſpecies: and this conſideration alone, perhaps, more than counterbalances all the boaſted privileges of ſuperior elegance and civilization reſulting from a city life.

From country villages, and not from crowded cities, have the preceding inſtances of longevity been chiefly ſupplied. For an illuſtration of this fact we refer to the article *Bills of* MORTALITY.

Attached as we are to life by the conſtitution of our nature, and deſirous of protracting the ſhort ſpan, it ſeems to be no leſs our duty than our intereſt to examine minutely into the various means that have been conſidered as conducive to health and long life; and to diſcriminate between thoſe that are collateral and accidental and ſuch as are eſſential to this great end. In order to obtain ſufficient data for reaſoning juſtly and ſatisfactorily on this ſubject, it would be deſirable to improve the mode of framing our bills of mortality; and with this view, it would be proper to add a particular account of the diet and regimen of every perſon, who dies at 80 years of age, or upwards; and to mention, whether his parents were healthy, long-lived people, &c. &c. All the circumſtances, that are moſt eſſentially neceſſary to life, may be compriſed under the ſix following heads: 1, air and climate; 2, meat and drink; 3, motion and reſt; 4, the ſecretions and excretions; 5, ſleep and watching; 6, affections of the mind. With regard to the firſt head, it may be obſerved that the common atmoſphere may be more or leſs healthy, in proportion as it abounds with pure dephlogiſticated gas, or oxygen; and as this is copiouſly ſupplied by the green leaves of all kinds of vegetables, we may hence in ſome meaſure account why inſtances of longevity are ſo much more frequent in the country than in great cities, where the atmoſphere is contaminated with noxious animal effluvia, and with mephitic air or carbonic acid. As to climate, various obſervations conſpire to prove that thoſe regions which lie within the temperate zones are beſt adapted to promote long life. Hence perhaps we may be enabled to explain, why Italy has produced ſo many perſons whoſe lives have been prolonged, and why iſlands in general are more ſalutary than continents. However, the Author of nature has wiſely enabled the inhabitants of hot and cold countries to endure great and ſurpriſing changes of temperature with impunity. See an account of experiments in a heated room, under the article HEAT. For the effects of *food* and *drink*, ſee theſe articles. It needs no proof, that alternate motion and reſt, ſleep and watching, are neceſſary conditions of health and longevity, and that they ought to be adapted to age, temperament, conſtitution, temperature of the climate, &c. Moreover, when the animal functions are duly performed, the ſecretions go on regularly; and the different evacuations ſo exactly correſpond to the quantity of aliment taken in, in a given time, that the body is found to return daily to nearly the ſame weight. Beſides, the due regulation of the paſſions, perhaps, contributes more to health and longevity than that of any other of the non-naturals. We may further add, that longevity is, in a great meaſure, hereditary; and that healthy, long-lived parents would commonly tranſmit the ſame to their children, if it were not for the frequent errors in the non-naturals, which ſo evidently tend to the abbreviation of human life. Nevertheleſs the duties and occupations of life will not indeed permit the generality of mankind to live by rule, and ſubject themſelves to a preciſe regimen. Fortunately, this is not neceſſary: for the divine Architect has, with infinite wiſdom, rendered the human frame ſo ductile, as to admit of a very conſiderable latitude of health; yet this has its bounds, which none can long tranſgreſs with impunity. For if old Parr, notwithſtanding ſome exceſſes and irregularities, arrived at ſo aſtoniſhing an age, yet we have reaſon to ſuppoſe that theſe were far from being habitual; and may alſo conclude, that had it not been for theſe abuſes, his life might have been ſtill conſiderably protracted.

On the whole, though ſome few exceptions may occur to what has been already advanced, yet it will be found, in general, that all extremes are unfriendly to health and longevity. Exceſſive heat enervates the body; extreme cold renders it torpid: ſloth and inactivity clog the neceſſary movements of the machine; inceſſant labour ſoon wears it out. On the other hand, a temperate climate, moderate exerciſe, pure country air, and ſtrict temperance, together with a prudent regulation of the paſſions, will prove the moſt efficacious means of protracting life to its utmoſt limits. Now, if any of theſe require more peculiar attention than the reſt, it is undoubtedly the laſt: for the ſocial paſſions, like gentle gales, fan the brittle veſſel calmly along the ocean of life; while, on the other hand, rough, turbulent ones daſh it upon rocks and quickſands. Hence, perhaps, it may be explained why the cultivation of philoſophy, muſic, and the fine arts, all which manifeſtly tend to humanize the ſoul, and to calm the rougher paſſions, are ſo highly conducive to longevity. And, finally, why there is no ſure method of ſecuring that habitual calmneſs and ſerenity of mind, which conſtitute true happineſs, and which are, at the ſame time, ſo eſſential to health and long life, without virtue.

"Æquanimitas ſola, atque unica felicitas."

LONGFORD, in *Geography*, a county of Ireland, in the north-weſtern extremity of the province of Leinſter. It has Roſcommon on the weſt, Leitrim and Cavan on the north, and Weſtmeath on the eaſt and ſouth. Its length from north to ſouth is 20 Iriſh miles (25 Engliſh), and its breadth from eaſt to weſt 19 Iriſh, or 24 Engliſh miles. It contains 134,152 Iriſh acres (215,522 Engliſh), which are divided into 23 pariſhes, all of which, except one, are in the biſhopric of Ardagh, united to Tuam. Though the northern angle conſiſts of rugged mountains, and the ſouth-weſtern part is chiefly bog to a great extent, yet Longford may be reckoned populous; and it ſupplies large quantities of oats for diſtant markets. About Granard is a fine tract of dry gravelly land, which is much uſed for fattening cattle. Lime-ſtone is here abundant; and it is ſurpriſing that, with this advantage, ſo little has been done towards reclaiming the bogs. In other parts of the county, the ſoil is in general a vegetable mould on the ſurface for three or more inches deep; under that, two inches thick of blue clay, which retains water; below this is yellow clay for two or three feet; and then lime-ſtone gravel. Oats is the grain principally raiſed. The linen manufacture has ſpread much through Longford. Spinning is univerſal, and there are now many weavers. The increaſe of the latter has been attributed to the liberal conduct of a gentleman, in giving 500*l*. to be lent to poor weavers, in ſums of 5*l*. each, which were to be repaid by quarterly payments of 25*s*. The benefits attending ſuch loans to the poor have been experienced in many places; and if care be taken in the management, it is a mode of aſſiſting them which encourages their induſtry, and can never be called *a premium for idleneſs and extravagance*. There are alſo ſome bleach greens; and great quantities of yarn are ſent to diſtant markets.

In the northern part of the county, near Lough Gawnagh, is a very rich iron ore in great abundance, not in thin beds, as that in the mountains near Lough Allen, and at Arigna in the adjoining county of Leitrim, but in ſolid rocks. It is of a dark red colour, and breaks into ſmall ſhelving pieces. There are alſo indications of coal in the ſame neighbourhood. Longford is well watered. The Shannon forms its weſtern boundary, and the Inny croſſes it in the ſouth. Lough Gawnagh, which covers ſeveral acres, is in the north; and ſome ſmall rivers flow into the Shannon, on one of which, called the Camlin, the town of Longford is ſituated. It is intended that the Royal Canal ſhould croſs this county, and join the Shannon at Tarmonbury; a meaſure which cannot fail of leading to much improvement, if it ſhould be ever completed. The towns are ſmall. For Longford, the county town, ſee the next article; and for Granard and Laneſborough, thoſe names in this work. Edgeworthſtown, which was by ſome accident omitted in the proper place, may be noticed here. It is not, indeed, remarkable for its ſize, but it is remarkable for the reſidence of a family, which is diſtinguiſhed for literary and ſcientific attainments. The name of Maria Edgeworth is too well known, and her talents as a pleaſing and uſeful author too generally acknowledged, to need the praiſe of the writer of this article. The ſame may be ſaid of her lively, ingenious, and patriotic father, Richard Lovell Edgeworth; and there is reaſon to expect that ſome of the younger branches of this family will add to a celebrity already very great. The writer has before him the reports of the bog commiſſioners, the eighth of which contains many proofs of the ingenuity of Mr. William Edgeworth. Mr. Edgeworth's houſe and the adjoining church contain many proofs of his mechanical ſkill.

The whole of the county of Longford was formerly called Annaly, and was a principality ſo late as the fifteenth century. It is now only repreſented in parliament by two knights of the ſhire; though it had, before the union, no leſs than four boroughs, which ſent two members each. Beaufort, &c.

LONGFORD, a poſt-town of the county of Longford, Ireland, of which it is the ſhire town. It is ſituated on the river Camlin, and is of tolerable ſize, and pretty well built. It has a charter ſchool for 60 boys. Longford is 59 miles W.N.W. from Dublin. Beaufort and Carliſle.

LONG-GNAN, a city of China, of the firſt rank, in the province of Se-tchuen, which contains a city of the third claſs under its juriſdiction, and is a place of great trade. N. lat. 32° 22′. E. long. 104° 18′.

LONG-HOU-KOEN a town of China, in the province of Hou-quang; 52 miles S.S.W. of Tao.

LONGIANO, a town of Italy, in the department of the Rubicon; 12 miles N.W. of Rimini.

LONGIMETRY, the art of meaſuring lengths, both acceſſible, as roads, &c., and inacceſſible, as arms of the ſea, &c.

Longimetry is a part of trigonometry, and a dependant on geometry, in the ſame manner as altimetry, planimetry, ſtereometry, &c.

The art of longimetry ſee under the names of the inſtruments uſed in it, particularly THEODOLITE, CHAIN, DISTANCE, &c. See alſo MENSURATION.

LONGING in pregnant women, an inordinate deſire for ſome particular kind of food, which, if denied, or not procured for them, was ſuppoſed to occaſion waſting, and ſometimes hyſteric affections, in the women, and on the child, beſides impairing its health, to impreſs the figure of the object longed for. This affection, which heretofore occaſioned in families much anxiety and uneaſineſs, ſeems wearing away, juſt in proportion as the belief in witches, ghoſts, and hobgoblins vaniſhes, or as reaſon and common ſenſe procure an aſcendency over ſuperſtition and impoſture. See that part of the article CONCEPTION, which treats of pica.

LONGINUS, DIONYSIUS, in *Biography*, celebrated for his treatiſe on the ſublime, flouriſhed in the third century, and is ſuppoſed by ſome to have been a native of Athens, by others of Syria. In his youth he travelled for improvement: he was known at Rome, Alexandria, and other cities diſtinguiſhed for literature; and attended upon the lectures of all the eminent maſters in eloquence and philoſophy. Such was the extent of his erudition, that he was ſtyled by his contemporaries "the living library." He appears to have taught philoſophy at Athens, where Porphyry was one of his diſciples. He was invited to the court of Palmyra, by its illuſtrious queen Zenobia, who took his inſtructions in the Greek language, and made uſe of his counſels on political occaſions. This diſtinction was fatal to him: he was executed by order of the emperor Aurelian, who proved victorious over the troops of Zenobia, and took her priſoner. The queen, to ſave herſelf, imputed the reſiſtance which ſhe made to her counſellors, of whom Longinus was ſuſpected to be the principal. The philoſophy of Longinus ſupported him in the hour of his trial, and he ſubmitted to his fate with reſignation and cheerfulneſs. This event took place in the year 273. Gibbon obſerves on this circumſtance, that the fame of Longinus will ſurvive that of the queen who betrayed, or the tyrant who condemned him. Genius and learning were incapable of moving a fierce unlettered ſoldier, but they had ſerved to elevate and harmoniſe the ſoul of Longinus. Without uttering a complaint, he calmly followed the executioner, pitying his unhappy miſtreſs, and beſtowing comfort on his afflicted friends. He was author of numerous writings. Dr. Pearce has collected the titles of twenty-five; but his treatiſe on the ſublime, already referred to, is the only one remaining; and this, as is well known to ſcholars, is in a mutilated and imperfect ſtate. The beſt editions of it are thoſe of Hudſon, Pearce, and Toup. It has been tranſlated into the Engliſh; but it is one of thoſe works which ſcarcely admits of a tranſlation. Speaking of this treatiſe, Mr. Smith, the tranſlator, ſays, "It is one of thoſe valuable remnants of antiquity, of which enough remains to engage our admiration, and excite an earneſt regret for every particle of it that has periſhed. It reſembles thoſe mutilated ſtatues, which are ſometimes dug out of ruins: limbs are broken off, which it is not in the power of any living artiſt to replace, becauſe the fine proportion and delicate finiſhing of the trunk excludes all hope of equalling ſuch maſterly performances." Smith's tranſlation of the treatiſe on the Sublime. Moreri. Gibbon. Harwood.

LONGISSIMUS Dorsi, in *Anatomy*, a muſcle of the back. See Dorsi.

LONGITUDE *of the Earth*, is ſometimes uſed to denote its extent from eaſt to weſt, according to the direction of the equator.

By which it ſtands contradiſtinguiſhed from the *latitude of the earth*, which denotes its extent from one pole to the other.

Longitude, in *Aſtronomy* and *Geography*. The longitude of any point of the heavens is the diſtance of its place, reduced to the ecliptic, from the vernal equinoctial point; that is, if a great circle paſs through a ſtar perpendicular to the ecliptic, the arc of the ecliptic intercepted between the interſection of this circle and the equinoctial point will be the longitude of the ſtar.

The longitude of a place on the ſurface of the earth, is a portion of the equator intercepted between a meridian paſſing through the place, and another meridian which paſſes through ſome principal city or obſervatory aſſumed as a point of departure, from which the longitudes of other places are taken. The reaſon why longitude is ſo differently defined on the celeſtial and terreſtrial globe, has been already explained under Latitude, to which article the reader is referred.

The ſubjects of aſtronomical inveſtigation, ariſing from different definitions, are ſo intimately connected, that much of the preſent has been already anticipated. Under Right Ascension we have ſhewn how, having given the longitude and latitude of a heavenly body, we deduce its right aſcenſion and declination: and under Latitude, a rule has been given for computing the longitude and latitude from the obſerved right aſcenſion and declination. But though we have ſhewn how the quantities are derived reciprocally one from the other, we have reſerved for this place to explain how they are originally derived from elementary obſervations. We are therefore to ſuppoſe the caſe of a practical aſtronomer who ſhould be deſirous of making a catalogue of ſtars, and of determining their longitudes and latitudes independent of previous obſervation, except only ſuch as are abſolutely neceſſary for determining the quantity of preceſſion, aberration, nutation, &c.

The obſerver is to be even ſuppoſed unacquainted with the latitude of his obſervatory, with the ſituation of the equinoctial points, and with the obliquity of the ecliptic. The principles of the method which we mean to explain were familiar to Flamſteed and the aſtronomers of that period, and are demonſtrated in De Lalande's and Vince's Aſtronomy. But the late Dr. Maſkelyne was the aſtronomer who improved and practiſed it with the greateſt ſucceſs in forming his catalogue of the thirty-ſix principal ſtars, and which would have been much more accurate than any ever known, had the inſtrument with which his obſervations were made been as perfect as thoſe of later conſtruction.

As no inſtrument now in uſe can give directly the longitude or latitude of a ſtar, it is neceſſary, firſt of all, to determine the right aſcenſions and declinations of thoſe ſtars of which we mean to form a catalogue. The method of determining the declination has been already explained at great length. (See Declination.) It is quite independent of the ſolar theory, and is derived by direct meaſurement of the meridian diſtance between the object and the pole. A mural circle, ſuch as that now erecting at Greenwich, determines this diſtance, without any reference to the zenith; but with a quadrant, and with aſtronomical circles of the uſual conſtruction, it is either abſolutely neceſſary, or at leaſt convenient, to employ the zenith. And in this caſe we determine by one ſeries of obſervations the diſtance of the zenith from the pole, and by another ſeries the meridional diſtance of the zenith from each particular ſtar. The firſt quantity, called the co-latitude of the place, being applied to the ſecond, or zenith diſtance of the ſtar, the ſum is the polar diſtance. It is evident, that all this may be performed without any knowledge of the ſolar theory, or even without a ſingle ſolar obſervation.

To determine the right aſcenſions of the ſtars, we might have aſſumed (had right aſcenſion been otherwiſe defined) any great circle perpendicular to the equator, and paſſing through any given ſtar, as α Aquilæ, exactly in the ſame manner as we aſſume an arbitrary meridian for the determination of terreſtrial longitudes. But as aſtronomers have agreed to aſſume, as their firſt celeſtial meridian, that which paſſes through the vernal equinoctial point, the ſolar theory neceſſarily becomes involved with the ſubject of our inveſtigation: we are, therefore, under the neceſſity of combining two diſtinct objects of enquiry. In the firſt place, it is neceſſary to determine exactly the relative ſituation of the ſtars with reſpect to each other and to the equator; and next, to place the ecliptic in its true poſition both with reſpect to the equator and to the fixed ſtars, and thus determine the ſituation of the equinoctial point. To have a clear idea of the whole of this proceſs, we ſhould obſerve that the two preliminary inveſtigations are perfectly independent of each other; for the conſtellations (as we remarked above) might be truly placed on the celeſtial globe without any knowledge of the ecliptic, and the ecliptic, in like manner, might be placed making its proper angle with the equator; and the declination of the ſun and its diſtance from the equinoctial point determined at any moment, by a ſeries of ſolar obſervations conducted without any reference to the fixed ſtars, and even without any knowledge of their exiſtence. It is by the combination of the reſults of theſe ſeparate inveſtigations that the intended object is accompliſhed. The practical method of conducting the whole of this operation is as follows:

In the firſt place, we aſſume the right aſcenſion of any given ſtar, as for example α Aquilæ, as near the truth as poſſible from prior determination, or we may conſider it as entirely unknown, and call it zero. This is quite immaterial, but the former method is the moſt uſual. The ſtars of the intended catalogue are then obſerved at the tranſit inſtrument for a ſeries of years, with a view to determine their difference of right aſcenſion from α Aquilæ and from each other. This inveſtigation would be much more ſimple than it is, if the fixed ſtars always preſerved the ſame relative poſition to each other, as the differences of right aſcenſion would then remain the ſame. But this is not the caſe; the apparent poſition of each particular ſtar is altered by the effects of aberration, preceſſion, ſolar and lunar nutation. The phenomenon of *Aberration* has been already explained. That of *Preceſſion* and *Nutation* will likewiſe be minutely deſcribed under their reſpective titles. At preſent, it is only neceſſary to obſerve, that the action of the ſun and moon (conſidered as conſtant forces) produce by their action on the protuberant regions of the equator a ſlow periodical revolution of the earth's axis about the pole of the ecliptic. By this motion the equinoctial points are carried backward, and the poſition of the equator among the fixed ſtars changes at every inſtant. If the effect of this phenomenon was ſimply to cauſe a change in the poſition of the equinoctial points, the difference of right aſcenſion of ſtars would not be affected by it; but it muſt be remembered, that the right aſcenſion of a ſtar is determined by a perpendicular drawn from the ſtar to the equator; now, the equator changing its place, this perpendicular will change its place alſo; that is, the ſtar will be conſtantly referred to a new point on the equator, and hence the right aſcenſion will vary from two cauſes; one, the motion of the equinoctial point, or point of departure, which will equally affect every ſtar; and the other from the change in the point of reference, by which, according to the definition, right aſcenſion is determined. It is the latter only of theſe two cauſes that affects the difference of right aſcenſions.

The ſolar and lunar nutations of the axis of the earth ariſe from the unequal action of the ſun and moon, by which the preceſſion of the equinoxes is not deſcribed in the uniform and ſimple manner above mentioned. The reader will ſee under Nutation, that the axis of the earth never points to its *mean* place; hence the *apparent* equator never coincides with the *mean* equator, or that circle which would be the equator, if theſe periodical nutations did not exiſt. Theſe derangements of the equator, and the correſponding oſcillations of the equinoctial points, affect both the longitudes and right aſcenſions of the ſtars, and likewiſe their declinations: their latitudes alone remain unchanged, for an oſcillation in the axis of the earth produces no change in the ecliptic, which depends only on the path which the centre of the earth deſcribes in ſpace, and which is not affected by the cauſes we have above mentioned; but the ecliptic itſelf is deranged by the action of the neighbouring planets, for theſe cauſe the centre of the earth to take actually a new path in the heavens, though they are too diſtant to derange the paralleliſm of the earth's axis by any unequal action on the equatorial regions. The ecliptic, in conſequence of this diſturbance, changes its point of interſection with the equator, which circle remains, from this cauſe at leaſt, unmoved, and conſequently the declinations of the ſtars remain unchanged; but their longitudes are affected, not only becauſe the equinoctial point is diſturbed, from which longitudes are reckoned, but likewiſe becauſe each ſtar is referred to a new point on the ecliptic; hence ariſes a ſecular variation in longitude, peculiar to each ſtar. The right aſcenſions are altered by the change of poſition in the equinoctial point, but this affects every ſtar alike, and therefore produces no change in the difference of right aſcenſion; in fact, the effect of this latter derangement enters as an element in the conſtant part of the preceſſion common to all ſtars. The nature of all theſe changes, or equations, as they are technically called, has been, or will be, deſcribed under their appropriate terms, as *Aberration*, *Nutation*, *Ecliptic*, *Secular Variation*, &c. &c. which ſee reſpectively.

Now the nicety and delicacy of the modern method of reducing obſervations, conſiſt in the exact determination of all theſe equations, and the due application of them to each ſeparate obſervation; ſo that inſtead of the apparent place, we make uſe of that in which we preſume the object would have appeared, had none of theſe periodical oſcillations exiſted. Agreeable to this conception of the ſubject, we may define ſome of the terms we have uſed above with greater preciſion than we have yet done. For inſtance, *mean right aſcenſion* of a ſtar, is the diſtance of the ſtar's place corrected for aberration, reduced to the mean equator, from the mean vernal equinoctial point. *Apparent right aſcenſion*, is the diſtance of the ſtar's place reduced upon the apparent equator from the apparent equinoctial point.

Mean declination, is the diſtance of a ſtar corrected for aberration from the mean equator. *Apparent declination*, is the apparent diſtance of the ſtar from the apparent equator. The *mean equator*, is an imaginary great circle of the heavens, about which the apparent equator revolves without ever coinciding with it, in the manner already deſcribed. The *apparent equator*, is that great circle of the heavens which actually correſponds with the equinoctial line on the earth, whatever the poſition of the earth may be at the moment of obſervation.

If, with the mean right aſcenſion, the mean declination, and the mean obliquity of the ecliptic, we compute the longitude of a ſtar, that longitude will be its mean longitude, that is, its place referred to the ecliptic will be reckoned from the mean equinox.

If, with the apparent right aſcenſion, the apparent declination, and the apparent obliquity, we compute the longitude, this will be reckoned from the apparent equinox. Sidereal time, (as uſed in theſe computations,) is that which has elapſed ſince the paſſage of the apparent equinoctial point over the meridian; for aſtronomers have not yet adopted a *mean ſidereal time*, which might be defined the interval which elapſes from the paſſage of the *mean equinoctial point*. This latter method would be more ſcientific than that now in uſe, and would be a ſimilar improvement to the ſubſtitution of *mean ſolar time* for apparent ſolar time. Were this latter mode adopted, an alteration muſt be made in our preſent tables of nutation, and the equation of the equinoxes in right aſcenſion, which now enters as common to all ſtars, would be omitted, as the ſame quantity would previouſly be applied to the error of the clock which is now applied to the ſtar.

We have been led into this digreſſion, and induced to dwell rather at length upon theſe preliminary conſiderations, becauſe we do not, at this moment, recollect any author that has entered much on the ſubject, to whom we can refer.

The right aſcenſion of α Aquilæ then, being aſſumed as near the truth as poſſible, the right aſcenſions of the other ſtars are to be inferred from it, by applying all the above equations, and likewiſe a correction for the error of the clock.

We ſubjoin an example of one day's computation, taken from the Greenwich Obſervations, 1809. The requiſite tables for theſe reductions, for aberration, preceſſion, nutation, have been given under Declination (Tables II. and III.), and for applying the error of the clock to each ſtar, the following table will be found very uſeful.

Table IV.

Names of Stars.	Decimal Multiplier.	Names of Stars.	Decimal Multiplier.
γ	0.003	Caſtor	0.486
α Aquilæ	0.000	Procyon	0.490
β	0.002	Pollux	0.494
α Capricorni	0.017	α Hydræ	0.433
α Cygni	0.037	Regulus	0.405
α Aquarii	0.093	β Leonis	0.335
Fomalhaut	0.028	β Virginis	0.334
α Pegaſi	0.134	Polaris, S. P.	0.283
α Andromedæ	0.179	Spica Virginis	0.269
γ Pegaſi	0.182	Arcturus	0.232
Polaris	0.217	1 α Libræ	0.209
α Arietis	0.260	2 α	0.209
α Ceti	0.298	α Cor. Bor.	0.177
Aldebaran	0.363	α Serpentis	0.172
Capella	0.389	Antares	0.142
Rigel	0.391	α Herculis	0.108
β Tauri	0.397	α Ophiuchi	0.094
α Orionis	0.419	α Lyræ	0.049
Sirius	0.455		

Example of one Day's Obſervations.

	Names of Stars, &c.	Tranſits of Stars.	Clock too ſlow, or Reduction to Sid. Time. +	Apparent Right Aſcenſion of Stars.	Correction by Table II.	Correction by Table III. ☽ ☊ 8ˢ 5°	Mean A.R. Jan. 0, 1807.
1807.		S. D. M. S.	S. D.	S. D. M. S.	S.	S.	S. D. M. S.
Sept. 6.	☉ Centr.	10 56 33 28	0 29.8	10 57 2 96			
	Arcturus	14 6 23 84	0 29.78	14 6 53 62	— 1.06	— 0.82	14 6 51 74
	α Serpentis	15 34 19 03	0 29.79	15 34 48 82	— 1.67	— 0.92	15 34 46 23
	α Ophiuchi	17 25 32 16	0 29.81	17 26 1 97	— 2.15	— 0.88	17 25 58 94
	α Lyræ	18 29 57 18	0 29.83	18 30 27 01	— 0.28	— 0.68	18 30 24 25
	γ	19 36 38 90	0 29.84	19 37 8 54	— 2.82	— 0.94	19 37 4 78
	α Aquilæ	19 40 55 74	0 29.84	19 41 25 58	+ 2.89	+ 0.94	Stand. Star †
	β	10 45 23 80	0 29.84	19 45 53 64	— 2.92	— 0.96	19 45 49 76
R—0.28	1 α Capric.	20 6 30 88	0 29.84	20 7 0 72	— 3.28	— 1.04	20 6 56 40
	2 α	20 6 54 58	0 29.84	20 7 24 42	— 3.28	— 1.04	20 7 19 96
	Capella	5 2 1 47	0 29.95	5 2 31 42	— 2.97	— 1.48	5 2 26 97
	Rigel	5 4 48 95	0 29.95	5 5 18 90	— 1.93	— 0.92	5 5 16 05
	β Tauri	5 13 39 64	0 29.95	5 14 9 59	— 2.48	— 1.24	5 14 5 87
	Sirius	6 36 10 70	0 29.97	6 36 46 67	— 1.28	— 0.88	6 36 38 51
	Pollux	7 33 2 16	0 29.98	7 33 32 14	— 1.64	— 1.14	7 33 29 36

† The ſigns are reverſed in the reduction, becauſe apparent A.R. is deduced from the aſſumed mean A.R. In the other ſtars the mean A. R. is deduced from the apparent.

In the above example the mean right aſcenſion of α Aquilæ is aſſumed 19ʰ 41′ 21.″75 for January 1, 1807, and its apparent right aſcenſion is deduced 19ʰ 41′ 25.″58 by applying the corrections of Tables II. and III. The firſt of theſe include the effect of preceſſion, aberration, ſolar nutation, and proper motion peculiar to the ſtar; the ſecond gives the nutation, including the equation of the equinoctial point, ſo that the whole correction, when applied, gives the interval of ſidereal time that ſhould elapſe between the paſſage of the ſtar and that of the apparent equinoctial point; this interval is 19ʰ 41′ 25.″58; and if the A.R. of the ſtar be rightly aſſumed, it is the time which the clock ſhould mark at the interval of the tranſit; but the clock marked only 19ʰ 40′ 55.″74. The difference is 29.″84, which we call the error of the clock, and ſince its rate is — 0.28, we can, by means of the above table, calculate the error of the clock for every other ſtar. For inſtance Capella, the decimal multiplier of which is 0.39, which is to be multiplied by the daily rate, — 0.28 × 0.39 = .109, which added to 29.″84 = 29.95, the reduction correſponding to

Capella, or the quantity to be added to the obſerved tranſit to obtain the apparent right aſcenſion. The apparent right aſcenſions are next reduced to mean right aſcenſions for the beginning of the year by Tables II. and III. obſerving to apply the contrary ſigns to thoſe for α Aquilæ, becauſe now the mean place is to be deduced from the apparent, whereas we deduced the apparent place of α Aquilæ from the mean.

A ſeries of obſervations and calculations, ſimilar to the above, being continued for a great length of time, a catalogue is to be formed, which, ſuppoſing the inſtrument to be perfect, will be ſubject to no other error than that of the aſſumed right aſcenſion of α Aquilæ, and with this error every right aſcenſion will be affected.

The ſun is likewiſe to be obſerved during the whole of this proceſs, and its right aſcenſion deduced as in the above example, and which will be ſubject to the ſame common error as ſubſiſts in the right aſcenſions of the ſtars.

While this ſeries of obſervations is going on at the tranſit inſtrument, both the ſun and ſtars are to be obſerved aſſiduouſly with the mural quadrant, or any other inſtrument deſtined to the determination of polar diſtances. We need not enter into the details of this proceſs, as it has already been minutely deſcribed under DECLINATION, but ſhall proceed to conſider the uſe we are to make of the reſult.

With reſpect to the ſtars, it is evident that by this double inveſtigation we have determined their places accurately, both with reſpect to each other and to the equator, ſo that we might place them in their true poſitions on the celeſtial globe, provided no attention was required to be given to the ſituation of the ecliptic; and this would be the caſe, if the interſection of a meridian paſſing through α Aquilæ with the equator, had been aſſumed as an arbitrary point of departure in the ſame manner, as we aſſume a meridian paſſing through Greenwich or Paris on the terreſtrial globe, as a ſtandard to which terreſtrial longitudes are referred. But the great circle to which celeſtial longitudes are referred, is required to paſs through the equinoctial point: it is the exact poſition, therefore, of this point which we are in ſearch of, and which is to be determined by the data we are now ſuppoſed to have collected.

The continued ſeries of ſolar obſervations gives us the obliquity of the ecliptic, and the declination of the ſun at the moment of obſervation, from which its right aſcenſion may be eaſily deduced by the ſolution of a right-angled ſpherical triangle; but in making theſe computations, attention muſt be paid to the periodical oſcillations of the equator, and to the ſecular variation of the ecliptic itſelf; that is, the right aſcenſions muſt be calculated with the apparent obliquity, that they may be reckoned from the apparent or variable equinoctial point, in the ſame manner as thoſe determined by the tranſit inſtrument, and with which they are now to be compared.

We have thus obtained a ſolar theory independent of the fixed ſtars, and the poſition of the fixed ſtars independent of the poſition of the ecliptic. It now only remains to combine theſe operations, and to place the ecliptic in its due poſition with reſpect to the fixed ſtars; and this is done in the following manner.

We begin by comparing the right aſcenſions of the ſun determined by the tranſit inſtrument, with the right aſcenſions determined on the ſame day with the quadrant; and if they agree, it is a proof that the right aſcenſion of α Aquilæ was rightly aſſumed; if they differ, as will moſt probably be the caſe, we muſt proceed and endeavour to aſcertain both the quantity and the cauſe of the diſcordance.

If we conſider one ſingle inſulated obſervation, the diſcordance may ariſe either from an erroneous aſſumption in the right aſcenſion of α Aquilæ, or from ſome defect in our ſolar theory, or from ſome error in the obſervation from which the declination of the ſun has been inferred. Now, though it would be impoſſible to aſſign the true cauſe of the diſcordance from one ſingle compariſon, yet the whole ſeries will lead us to the truth, from this fortunate circumſtance, that whatever error any defect in the ſolar obſervations produces in any one obſervation, the ſame defect will produce an equal error, but with the contrary ſign, in an obſervation in which the ſun is 180 degrees from its firſt poſition.

In ſelecting obſervations thus circumſtanced, it muſt however be remembered, that although in theory we may determine the right aſcenſion of the ſun by trigonometrical calculation from any given declination, yet practically, no exactneſs can be expected, except when the change of declination is conſiderable, which only happens near the equinoxes. The exact limits in which the compariſon may without impropriety be made, muſt depend on the accuracy of the inſtruments, and on the confidence of the obſerver in the correctneſs of his obſervations. In general, the period ſhould not be extended to more than ſix or eight weeks on each ſide the equinox.

When the ſeries of obſervations is complete, the reſults are to be arranged and compared as in the following table:

		A.R. of the Sun as deduced from Tranſit Obſervations.	A.R. of the Sun as deduced from obſerved Declinations of the Sun.	Differ.			A.R. of the Sun, as deduced from Tranſit Obſervations.	A.R. of the Sun, as deduced from obſerved Declinations of the Sun.	Differ.	Sum.	Half ſum, or Error.
		° ′ ″	° ′ ″	″			° ′ ″	° ′ ″	″	″	″
Feb.	17	330 23 24.0	330 23 27.9	+ 3.9	Oct.	26	210 12 15.0	210 12 22.5	+ 7.5	+ 11.4	+ 5.7
	22	335 11 26.2	335 11 28.5	+ 2.3		20	204 29 52.5	204 29 47.8	− 4.7	− 2.4	− 1.2
March	5	345 31 40.9	345 31 49.5	+ 8.6		11	196 6 31.9	196 6 26.5	− 5.4	+ 3.2	+ 1.65
	7	347 22 48.6	347 22 46.7	− 0.9		6	191 31 20.2	191 31 23.8	+ 3.6	+ 2.7	+ 1.35
	15	354 43 44.4	354 43 55.5	+ 11.1	Sept.	27	183 21 54.6	183 21 54.2	− 0.2	+ 10.9	+ 5.45
	21	0 11 56.7	0 11 58.3	+ 1.6		25	181 33 48.4	181 33 40.3	− 8.1	− 6.5	− 3.2
April	5	13 49 36.3	13 49 42.6	+ 6.3		7	165 22 56.4	165 22 48.1	− 8.3	− 2.0	− 1.0
	6	14 44 21.1	14 44 27.0	+ 5.9		6	164 28 46.6	164 28 42.2	− 4.3	+ 1.6	+ 0.8
	7	15 39 0.9	15 39 7.9	7.9		5	163 34 26.5	163 34 28.0	+ 1.5	+ 9.4	+ 4.7
									Mean of 9, or Correction of Catalogue -		+ 1.572

Let us examine one compariſon, for the ſake of example, in the above table; for inſtance, March 5th. It appears, that on that day the right aſcenſion deduced from the quadrant obſervation differed + 8″.6 from that obſerved at the tranſit. Now it is preſumed, that a part of this error may be in the diviſions of the quadrant, or in the aſſumed latitude, or in the obliquity of the ecliptic: we, therefore, compare this reſult with its correſponding one, Oct. 11th, when we find the error to be − 5″.4; hence we infer, that 3.″2 only is to be attributed to the error of the tranſit obſervations, and that 1.″6, or the half, is the real error of the catalogue common to every ſtar; ſince, had that quantity been added, the poſitive and negative error would have been equal, and would have been therefore aſſigned altogether to the ſolar obſervations.

The beauty of Dr. Maſkelyne's method, which we have thus endeavoured minutely to deſcribe, conſiſts in this, that it is not only extremely independent of thoſe errors that are moſt likely to occur in a ſeries of ſolar obſervations, but that it is capable of furniſhing a clue to aſcertain both the amount and cauſe of thoſe errors. As this would lead us to an inveſtigation rather foreign to the preſent ſubject, we ſhall not at preſent enter into theſe conſiderations.

Secular variation in the longitude of the fixed ſtars.

When the longitudes and latitudes of a number of ſtars are determined for a given period, theſe are computed for any diſtant period, by applying the preceſſion of the equinoctial points, and likewiſe the ſecular variation for each particular ſtar, and for which purpoſe a very accurate table has already been given under Latitude. This ſecular variation ariſes from the real change of poſition in the ecliptic itſelf; inaſmuch as this affects the ſituation of the equinoctial point. The effect is common to all ſtars; and, therefore, this part of it only influences the quantity of the general preceſſion; but becauſe the poſition of the ecliptic is really changed among the conſtellations, each ſtar becomes referred to a new point.

Though the trigonometrical inveſtigation of the exact quantity of theſe changes is extremely complicated; yet the principle may be rendered ſufficiently intelligible, by recollecting that a change in the poſition of the equator diſturbing the equinoctial points, produces a change in the longitudes, right aſcenſions, and declinations, the latitudes only remaining the ſame. But a ſimilar change in the ecliptic produces a change in the longitudes, latitudes, and right aſcenſions, whilſt the declinations remain unaltered. In other words, the diſplacement of the equator affects every thing but the latitudes, and a diſplacement of the ecliptic every thing but the declinations.

On the methods of determining the poſitions of places on the ſurface of the earth, or their longitudes and latitudes.

The general nature of the problem having been already explained under Latitude; and ſeveral practical methods of determining the longitude having been deſcribed at great length under Chronometer and Degree; we have now to explain a variety of aſtronomical proceſſes which have been deviſed and brought to a great ſtate of perfection within theſe laſt fifty years. Longitude, being only a relative term, *to find the longitude of a place*, is, in fact, to determine the difference of the longitude of two given places. And here we may obſerve rather a curious circumſtance, which is, that though the problem is in its ſtatement purely geographical, yet it can only be ſolved by the aid of aſtronomy, except upon the hypothetical ſuppoſition of a trigonometrical meaſurement extended over the whole ſurface of the earth, or at leaſt over a great circle of its circumference. This being impoſſible, we muſt have recourſe to the general principle we have ſo often had occaſion to refer to in former aſtronomical articles. We ſuppoſe, at any given moment, every point of the convex ſurface of the earth correſponds with ſome point in the concave ſurface of the heavens, called its zenith; and as the angular diſtance is the ſame on each, by meaſuring the angular diſtance of the celeſtial arc, which is always acceſſible, we obtain the correſponding and equal angular diſtance of the terreſtrial arc, which otherwiſe would be practically impoſſible. Thus, for inſtance, one perſon at London, and another at Jamaica, have no means of knowing the exact proportion of the earth's circumference intercepted between them, except, indeed, by the inaccurate eſtimate of the length of a ſhip's track in ſailing from one place to another; but if, by ſome artifice, each could aſcertain, at any given moment, his zenith point in the heavens; then, as the angular diſtance of theſe zenith points could eaſily be meaſured, the correſponding terreſtrial arc would immediately be determined. Now to this, or ſome very ſimilar principle, may every proceſs for finding the longitude be referred.

The inveſtigation of the ſubject will be much ſimplified, if we ſuppoſe the equator, inſtead of being divided into 360 degrees, to be divided into 24 parts, and each part into 60, and ſubdivided again into 60. As each of theſe larger diviſions paſſes under a celeſtial meridian in one hour of ſidereal time, they are called hours to avoid circumlocution, though it is evident that a portion of a line cannot be an hour, or any part of time. But as the difference of meaſure will be expreſſed in the ſame terms as the difference of time, this mode of diviſion is extremely uſeful, and ſhews us at once, that to determine the difference of longitude between two places, is equivalent to determining the difference of apparent time that exiſts between two places at any one given inſtant. The moſt obvious way of accompliſhing this, is for two obſervers to watch ſome inſtantaneous phenomenon, and to mark the inſtant of apparent time at which each obſerved it. The inſtantaneous exploſion of a maſs of gunpowder is extremely well adapted for this purpoſe when the diſtance is not great, and has been ſucceſsfully employed in the ſouth of France, and in the north of Europe. It is evident that this method can only be employed for very limited diſtances: for places more remote, we are obliged to recur to the celeſtial phenomena, and we ſelect thoſe which have the greateſt reſemblance to the above, that is, which are the moſt inſtantaneous, and which appear the moſt nearly alike to two obſervers at the ſame actual inſtant of time. Unfortunately, there are none which unite theſe deſirable combinations of circumſtances. Eclipſes of Jupiter's ſatellites, and of the moon, unite them in a very conſiderable degree, and accordingly have been employed to great advantage, particularly in the early ſtate of geography, and in caſes where the ſituation of the place was previouſly unknown.

An occultation of a fixed ſtar is a very inſtantaneous phenomenon, but it is not ſeen at the identical inſtant of actual time by each obſerver; for, from the vicinity of the moon and its conſequent parallax, it may to one obſerver appear to paſs over a fixed ſtar, when to another it may appear to paſs entirely over or under it: hence, even in the caſe where an occultation is obſerved by two perſons, the difference of longitude cannot be inferred by ſimply noting the difference of time at which the phenomenon happened to each obſerver. This defect, however, may be completely ſupplied by calculation, and therefore it is juſtly conſidered as one of the moſt accurate methods that can poſſibly be deviſed. We ſhall refer our readers to aſtronomical writers for examples of the various methods: our object at preſent is only to give a ſketch of the different principles on which they are founded.

The longitude of a place on land may likewiſe be found with conſiderable exactneſs, by obſerving the paſſage of the moon over the meridian, and comparing it with the paſſage obſerved in ſome fixed obſervatory. A much greater accuracy will be obtained by this method, if ſeveral ſucceſſive tranſits of the moon be taken at either place of obſervation, as then the motion of the moon in right aſcenſion will be obtained without the aid of calculation: but it will be requiſite to attend to the equation of ſecond differences, and even then the irregularity of the moon's motion in 24 hours is ſo great, that a very ſenſible error may ſtill remain uncorrected.

Several writers, in explaining this method, appear to have fallen into a miſconception of the ſubject, by confounding together the retardation of the moon in 24 hours, with the real retardation obſerved between two ſucceſſive tranſits, and which latter ſhould evidently be uſed in calculating the proportional retardation correſponding to a given difference in longitude. Suppoſe, for inſtance, for the ſake of rendering the ſubject as intelligible as poſſible, that the motions of the ſun and moon were perfectly uniform and in the equator, and that they both paſſed the meridian of Greenwich at mean noon (which would, according to our ſuppoſition, be the ſame as apparent noon); ſuppoſe that the next day the moon paſſed the meridian of Greenwich at 1^h after noon. It is evident that the retardation would be one hour in *twenty-five* hours. On the oppoſite meridian the moon will paſs at $0^h\ 30'$, at which inſtant it will be $12^h\ 30'$ mean time at Greenwich, or the half of 25 hours, this being the proportion of time anſwering to a retardation of $30'$. In general, the attention of the calculator ſhould be directed to finding the mean time at Greenwich, and to compare with this the mean time at the place of obſervation. The reader, who wiſhes to ſee more on this particular method, may conſult a paper by Mr. Gavin Lowe in the 15th vol. of Tilloch's Philoſophical Magazine.

Hitherto we have ſuppoſed two obſervations made by two obſervers, one at each place, whoſe difference of longitude with the other is to be determined; but it is evident that this is impracticable in many caſes, and particularly in the one of the greateſt importance, namely, when the object is to determine the longitude at ſea. Here the mariner muſt be ſupplied with one calculated or ſuppoſed obſervation, inſtead of one really obſerved. The difficulty to be ſurmounted in this caſe is extremely great: of the immenſe number of methods more or leſs plauſible that have been ſuggeſted, two only are in uſe at preſent, the one by the means of a *chronometer*, already explained at great length under that article; the other the lunar method, which has been gradually improved by the labour of ſucceeding aſtronomers, from the time it was firſt ſuggeſtd, many years ago, to the preſent moment, when it is brought ſo near perfection, that no reaſonable hope can be entertained of any very conſiderable improvement.

The early navigators had no means of eſtimating their longitude but by the computed run of the ſhip; and the dangers they incurred by this inaccurate method, were ſufficient to convince every enlightened government, particularly of maritime ſtates, of the importance of encouraging, to the utmoſt effort of human ingenuity, what could be directed to the improvement of this defective ſtate of navigation.

The early ſpeculations of aſtronomers were of but little practical utility to the navigation of thoſe times. In the 16th century, eclipſes of the moon were ſtrongly recommended; but they happened very ſeldom, and were too inaccurately computed to be of any great uſe. Perhaps, now and then, the approximate longitude of an almoſt unknown country, where a mariner might accidentally be on ſhore, was computed by this method, but to determine the place of a ſhip it was perfectly inadequate.

Philip III. of Spain, in 1598, offered an hundred thouſand crowns; and the ſtates of Holland, at the beginning of the ſeventeenth century, propoſed a reward of thirty thouſand florins to the perſon who ſhould be fortunate enough to ſolve this difficult and important problem. In 1635, John Morin, profeſſor of mathematics at Paris, propoſed a method of reſolving it to cardinal Richelieu, extremely ſimilar to the lunar method now in uſe; but it was rejected as of no practical utility: and indeed, at that period, neither the lunar tables were of ſufficient accuracy, nor the nautical inſtruments delicate enough to render the lunar method very promiſing. However, though the commiſſioners, who were appointed to examine this method, judged it inſufficient, on account of the imperfection of the lunar tables, cardinal Mazarin, in 1645, procured for him a penſion of 2000 livres.

Many attempts were founded on the theory of the magnetic variation; but none of theſe ſucceeded. It was the general opinion of aſtronomers, that the moon's motion was the moſt promiſing phenomenon to ſelect; but long after the idea was firſt ſuggeſted, neither lunar tables nor inſtruments were ſufficiently exact to render any method, founded on this theory, practically uſeful. Still, however, there was a rational hope that theſe difficulties might be overcome.

The firſt perſon who recommended the inveſtigation of the longitude, from obſerving the diſtance between the moon and ſome ſtar, is ſaid to have been John Werner, of Nuremberg, who printed his annotations on the firſt book of Ptolemy's Geography, in 1514: Peter Apian, profeſſor of mathematics at Ingolſtadt, in 1524; Oronce Fine, of Briançon, about 1530; Gemma Friſius, at Antwerp, in 1530; Nonius or Pedro Nunez, in 1560; and Kepler, in 1630; all ſuggeſt and recommend the ſame method. In 1675, king Charles II. erected the obſervatory at Greenwich, and appointed Mr. Flamſteed his aſtronomical obſerver, with this expreſs command, that he ſhould apply himſelf with the utmoſt care and diligence to the rectifying the table of the motions of the heavens, and the places of the fixed ſtars, in order to find out the ſo much deſired longitude at ſea, for perfecting the art of navigation. To the fidelity and induſtry with which Mr. Flamſteed executed his commiſſion, we are in a great meaſure indebted for that curious theory of the moon, which was afterwards formed by the immortal Newton. This incomparable philoſopher made the beſt uſe which human ſagacity could make of the obſervations with which he was furniſhed; but, as theſe were interrupted and imperfect, the difference of ſir Iſaac's theory from the heavens would ſometimes amount at leaſt to five minutes. Dr. Halley employed much time on this ſubject; and a ſtarry zodiac was publiſhed under his direction, containing all the ſtars to which the moon's appulſe can be obſerved: but for want of proper inſtruments and correct tables, he could not proceed in making the neceſſary obſervations. In a paper on this ſubject he expreſſes his hope, that the inſtrument juſt invented by Mr. Hadley might be applied to taking angles at ſea with the deſired accuracy. (See Phil. Tranſ. N° 421.) This great aſtronomer, and after him the abbé de la Caille, and others, have reckoned the beſt aſtronomical method of finding the longitude at ſea, to be that wherein the diſtance of the moon from the ſun, or from a ſtar, is uſed; for the moon's daily mean motion being about thirteen degrees, her hourly mean motion is about half a degree, or one minute of a degree in two minutes of time; and ſo an error of one minute of a degree in poſition will produce an error of two minutes in time, or half a degree in longitude: and if by obſervation it is determined what part of her daily motion the moon has run through during the interval between a certain point of time under a known meridian, and the inſtant of time when the obſervations are made on her, under an unknown meridian, then her daily motion at that time will have, to the part thereof determined by obſervation, the ſame ratio which twenty-four hours has to the interval of time taken to deſcribe that arc.

It was in the year 1714 that the parliament of Great Britain firſt began to conſider this queſtion as an object of national concern. And the loſs of ſir Cloudeſly Shovel's fleet ſeems to have had ſome effect in drawing their attention to this ſubject; at leaſt, if we may judge from the following document, copied from a manuſcript in the Royal Obſervatory, ſigned by thoſe well-known perſonages, William Whiſton and Humphrey Ditton. It appears to have been one of the many petitions preſented to the houſe of commons on this occaſion.

Reaſons for a Bill, propoſing a Reward for the Diſcovery of the Longitude.

I. This bill is unexceptionable, becauſe it is general, and not confined to any one project, perſon, or method; but gives equal hopes to all judicious propoſers whatſoever.

II. Becauſe in this bill no money is inſiſted on, before any method for the diſcovery of the longitude is, upon trial, actually found practicable and uſeful.

III. Becauſe ſir Iſaac Newton's own paper, delivered into the Committee, gives hopes that the known method by the theory of the moon, which is hitherto not exact enough, may, upon due encouragement, in time be brought to perfection.

IV. Becauſe the method now propoſed is owned by all, to whom it has been communicated, to be certainly *true in theory:* it cannot, therefore, be fit to have it concealed, even though it were not yet known to be practicable; becauſe, in that caſe, future improvements might ſtill make it ſo.

V. Becauſe its great uſe at land and in geography is indiſputable, and was diſtinctly obſerved by ſir Iſaac Newton and Dr. Halley, upon the firſt propoſal of this method to them: and we beg leave to ſay, that this uſe alone is *ſo great and extenſive,* that if there were no other, it would highly deſerve the encouragement of the public.

VI. Becauſe another great uſe is alſo undoubted, *viz.* for all places in the narrow ſeas, and within about 100 miles of all ſhores and iſlands; that is, for all places where ſhips are in the greateſt danger, as ſir Iſaac Newton owned to the committee; ſo that if this method extended no farther, yet it would highly deſerve the public encouragement.

VII. Becauſe there is little or no reaſon to doubt of its uſe at any place at ſea, even where ſhips are allowed to be in the leaſt danger; ſince, in the moſt doubtful caſe of all, ſir Iſaac Newton has, in his paper delivered to the committee, propoſed an effectual remedy, as will be clearly underſtood, when the method itſelf is known to the world.

VIII. Becauſe this method will ſave the nation great ſums of money, which the want of it does now occaſion, as will appear upon trial.

IX. Becauſe the charges of it will be inconſiderable, in compariſon of the advantage, as will alſo fully appear upon trial.

X. Becauſe it will prevent the loſs of abundance of ſhips and lives of men; as it would certainly have ſaved all ſir Cloudeſly Shovel's fleet, had it then been put in practice.

XI. Becauſe it is eaſy to be underſtood and practiſed by ordinary ſeamen, without the neceſſity of any puzzling calculations in aſtronomy.

And we take leave to recommend the learned Savilian profeſſor of geometry at Oxford, Dr. Halley, as the fitteſt perſon in the world for the trial, and practice, and improvement of this method; and do hereby declare, that we are willing that he go equal ſhares with us in the reward, if he pleaſe to undertake ſo uſeful a work, and the public pleaſe to make that reward equivalent to the great dignity and importance of the diſcovery.

June 10, 1714.
Will. Whiston.
Humphrey Ditton.

Accordingly an act was paſſed in this year, 1714, in the Britiſh parliament, appointing and empowering certain commiſſioners to make out a bill for a ſum not exceeding 2000*l.* towards making neceſſary experiments; and alſo granting a reward to the perſon who ſhould diſcover the longitude at ſea, proportioned to the degree of accuracy that might be attained by ſuch method; *viz.* a reward of 10,000*l.*, if it determines the ſame longitude to one degree of a great circle, or ſixty geographical miles; 15,000*l.*, if it determines the ſame to two-thirds of that diſtance; and 20,000*l.*, if it determines it to half that diſtance. It is added, that one moiety or half part of ſuch rewards or ſum ſhall be due and paid when the ſaid commiſſioners, or the major part of them, do agree that any ſuch method extends to the ſecurity of ſhips, within eighty geographical miles from the ſhores, which are places of the greateſt danger; and the other moiety or half part, when a ſhip, by the appointment of the ſaid commiſſioners, or the major part of them, ſhall thereby actually ſail over the ocean, from Great Britain to any ſuch port in the Weſt Indies as thoſe commiſſioners, or the major part of them, ſhall chuſe or nominate for the experiment, without loſing her longitude beyond the limits above mentioned. 12 Ann. cap. 15. See alſo ſtat. 14 Geo. II. cap. 39. 26 Geo. II. cap. 25. By ſtat. 14 Geo. III. all former acts concerning the longitude at ſea are repealed, except ſo much of them as relates to the appointment and authority of the commiſſioners thereby conſtituted, and alſo ſuch clauſes as relate to the conſtructing, printing, publiſhing, &c. of nautical almanacs, and other uſeful tables; and it is enacted, that any perſon, who ſhall diſcover any method for finding the longitude by means of a time-keeper, ſhall be entitled to the propoſed reward, as we have already ſtated under the article Chronometer; which ſee.

From the very conſiderable improvements made by ſir Iſaac Newton in the theory of the moon, and more lately by M. Euler, and others on his principles, Mr. Tobias Mayer, profeſſor of Gottingen, was enabled to calculate lunar tables more correct than any that were before publiſhed, and he has ſucceeded ſo far as to give the moon's place within one minute of the truth. This has been proved by a compariſon of the tables with the obſervations made at the Greenwich obſervatory by the late Dr. Bradley, and by Dr. Maſkelyne. Theſe tables, for which the widow of Mr. Mayer was rewarded by the Britiſh parliament, were publiſhed in 1770, by Dr. Maſkelyne, by order of the commiſſioners of longitude. Dr. Maſkelyne, in his voyage to St. Helena, in 1761, made uſe of theſe tables, and found them to anſwer for the diſcovery of the longitude, within a degree; and in order to facilitate the general uſe of them, he propoſed a nautical ephemeris, the ſcheme of which was adopted by the commiſſioners of longitude, and firſt executed in the year 1767; and the publication has been regularly continued ever ſince. But as the rules that were given in the appendix to one of thoſe publications, for correcting the effects of refraction and parallax, were deemed too difficult for general uſe, they were reduced to tables: ſo that by the help of the ephemeris, theſe tables, and others that are provided, the calculations relating to the longitude, which could not be performed by the moſt expert mathematician in leſs than four hours, may now be completed with greater eaſe and accuracy in half an hour. Dr. Maſkelyne obſerved, that the error of Mr. Mayer's laſt lunar tables ſcarce ever exceeds 1′ at the moſt, and ſeldom amounts to 20″; and, therefore, the uncertainty hence ariſing in the determination of the longitude, can ſcarcely exceed half a degree, and generally will not exceed ten miles.

We obſerve, in general, with regard to the hiſtorical part of this article, that when Hadley had invented the quadrant, or octant, which ſtill bears his name, and when Mayer had brought the lunar tables to an unexpected degree of preciſion, aſtronomers of every nation began to conceive the moſt rational hopes, that, by gradual improvement, this method would at laſt be found to equal the moſt ſanguine expectation.

Thoſe who firſt attempted to practiſe it had to ſtruggle with great difficulties; and the requiſite calculations were ſo formidable, that none but aſtronomers, or at leaſt very able calculators, could poſſibly attempt them.

The late aſtronomer royal, Dr. Maſkelyne, practiſed this method with the greateſt ſucceſs; and it is to him this country is indebted for ſome of the greateſt improvements that have been made. It was he who firſt propoſed and ſuperintended the conſtruction of the Nautical Almanac, which relieves the calculator from all the very laborious part of the proceſs; and the remaining part of the computation has been ſo ſimplified by ſucceſſive improvements, both in the formulæ and conſtruction of tables, that, at preſent, the neceſſary obſervations may be both made and computed by any mariner, who has received a tolerably good nautical education.

As the practical methods of making and computing a lunar obſervation are given at great length in every nautical book, we ſhall confine ourſelves to explaining the general nature and object of the problem, and refer the reader to profeſſed treatiſes on navigation for farther information. In Mackay's treatiſe on the Longitude, the reader will find ſome excellent methods of ſolving both this and a variety of other nautical problems, accompanied by very uſeful tables. Mendoza's tables contain his own valuable method of computing a lunar obſervation, beſide general tables for every nautical purpoſe. The requiſite tables are well known, and are in the hands of every navigator.

Explanation of the principles of the method by which the longitude is found at ſea, by obſerving the diſtance of the moon from the ſun, or a given fixed ſtar.

The requiſite data for determining the longitude at ſea, by the lunar method, are the apparent diſtance of the centre of the moon from the centre of the ſun or ſtar, and the apparent altitude of the centres of each at the moment of obſervation. Hence three obſervers are uſually employed: one obſerves the diſtance between the ſun and moon, one the altitude of the ſun, and the other the altitude of the moon. When this cannot be done, the place of the other two may be ſupplied by computation.

By means of lunar tables, the exact diſtance of the moon from the ſun or ſtar is computed for every three hours, for the meridian of Greenwich. We are not, however, to ſuppoſe that theſe diſtances are ſuch as the moon and ſun would *appear* to have at Greenwich; but ſuch as they would appear to an obſerver at the centre of the earth. It is for *Greenwich time* only that they are computed; a circumſtance not ſufficiently inſiſted upon by elementary writers on this ſubject. From theſe tables (of the Nautical Almanac) it is eaſy to infer the diſtance for any intermediate interval: a ſimple proportion will be ſufficient for this purpoſe. We may therefore conſider ourſelves as in poſſeſſion of an inſtantaneous phenomenon, anſwering to every inſtant of time at Greenwich; ſince the diſtance of the ſun and the moon are never the ſame for two ſucceſſive inſtants of time. Now if we conſider the converſe of this propoſition, it is equally evident, that if we have given the diſtance of the moon from the ſun, as ſeen from the centre of the earth; we can, by the ſame tables, infer the exact time at Greenwich correſponding to this diſtance. Now the object of a lunar obſervation is to determine this diſtance at a given moment of actual time, to aſcertain the apparent time at this moment for the meridian of the obſerver, and to compare it with the moment of Greenwich time, which is to be inferred from the given diſtance. Now the difficulty of the proceſs ariſes from this circumſtance, that ſince, to an obſerver on the ſurface of the earth, the moon appears always depreſſed by the effect of parallax, and the ſun elevated by the effect of refraction, the angular diſtance obſerved with a ſextant, or any other inſtrument, is not the ſame as the diſtance ſeen from the centre of the earth, and for which alone the nautical tables are calculated. Hence a ſpherical computation becomes neceſſary. Two caſes of oblique ſpherical triangles muſt be computed, before the obſerved diſtance can be corrected, and the true diſtance aſcertained.

The general nature of the problem may be more eaſily underſtood by a reference to the figure (*Plate* XVII. *Aſtronomy*, *fig.* 1.), which is a projection of the ſphere on the plane of the meridian: ☽ ⊙ is the obſerved or *apparent diſtance* of the ſun and moon; Z ☽ is the zenith diſtance of the moon; Z ⊙ that of the ſun; m is the true place of the moon, when corrected for refraction and parallax, which together tend to *apparently* depreſs it; s is the true place of the ſun, when corrected by refraction and parallax, which together tend apparently to elevate it: for the moon's parallax is always greater than the refraction, the ſun's always leſs. For a ſtar, the ſimple correction for refraction is all that is required.

We have now, therefore, given three ſides in the triangle Z ⊙ ☽, and two ſides (*viz.* Z m, Z s) in the triangle Z ms.

In the triangle Z ⊙ ☽, the angle Z may be found from the three given ſides; and then with Z m, Z s, and the included angle Z found above, ms, or the true diſtance, may be obtained.

To ſhorten the ſolution of this problem, and to reduce it within the compaſs of a mariner's ordinary powers of computation, has been an object with the firſt geometricians in Europe. It would lead us much beyond our limits to give a hiſtory of the numerous ſolutions that have been propoſed. The French mathematicians, probably not having a great facility of conſtructing tables, have directed their attention chiefly to ſuch methods as require only the common tables of logarithms. In our own country, where the board of longitude is always ready to publiſh any uſeful tables that may be approved, thoſe methods and formulæ have been in general preferred, which admitted of the ſhorteſt ſolution by means of tables. In this reſpect, a progreſſive ſeries of improvement has taken place ſince the firſt introduction of the method; and a ſkilful mariner will now compute the true diſtance from the apparent in five minutes, when formerly as many hours were required.

Beſides the methods founded on a direct trigonometrical ſolution, there are many (ſuch as Lyon's and Dr. Maſkelyne's) which are founded on rather a different principle. The ſmall triangle ☽ mm' is computed as if a plane one, ☽ m' being the effect of the total depreſſion of the moon in changing the diſtance: a ſimilar triangle is formed for computing the effect of refraction for the ſun or ſtar. Various formulæ have been deduced from each of theſe principles, for the inveſtigation of which the reader may conſult Cagnole's Trigonometry, and various volumes in the Connoiſſance des Temps. A very clear and ſcientific inveſtigation of all theſe methods was given by Mr. Mendoza, in the Philoſophical Tranſactions for 1797.

To enable the reader to judge of ſome of the moſt approved of theſe, we ſhall give a ſolution of the ſame problem by a variety of different ways.

Given Apparent altitude ⊙	-	32° 34′ 47″
Apparent altitude ☽	-	39 3 4
Apparent diſtance ⊙ ☽	-	86 10 19
Horizontal parallax	-	0 58 28

Required the true diſtance.

The firſt example we ſhall give is the method of Borda, which is in general uſe among the more ſkilful of the French navigators.

The formula is as follows:

$$\text{Let } \frac{1}{\text{coſ. } \frac{1}{2}(A+H)} \cdot \sqrt{\frac{\text{coſ. } \frac{1}{2}(d+a+b)\ \text{coſ. } \frac{1}{2}(d \backsim (a+b))\ \text{coſ. } A\ \text{coſ. } H}{\text{coſ. } a\ \text{coſ. } b}} = \text{ſin. } N.$$

Then $\text{ſin. } \frac{1}{2} D = \text{coſ. } \frac{1}{2}(A+H)\ \text{coſ. } N.$

In which A = true altitude of ☽
a = apparent altitude of ☽
H = true altitude of ⊙
b = apparent altitude of ⊙
d = obſerved or apparent diſtance ⊙ ☽
D = true diſtance required.

Example I.—Borda's Method.

Apparent diſtance ⊙ ☾ -	86° 10′ 19″			
Apparent altitude ⊙ -	32 34 47	Com. ar. log. coſ.	0.0743564	
Apparent altitude ☾ -	39 3 4	Com. ar. log. coſ.	0.1098114	
Sum - -	157 43 10			
Half ſum - -	73 54 5	—— log. coſ.	9.2844266	
Diſtance half ſum -	7 16 14	—— log. coſ.	9.9964940	
Corrected altitude ⊙ -	32 33 25	—— log. coſ.	9.9257539	
Corrected altitude ☾ -	39 47 18	—— log. coſ.	9.8855952	
Sum - -	72 20 43	Sum -	39.2764375	
		Half ſum	19.6382187	Diff. 9.7312148, which is the log. ſin. N.
Half ſum - -	36 10 21.5	—— log. coſ.	9.9070039	
		Log coſ. N. -	9.9256221	
		Sum log. ſin. of the	9.8326260	
		Half diſtance -	42° 51′ 29″	
		True diſtance -	85 42 58	

When Callet's Logarithms are uſed, much labour may be avoided, by taking the neareſt multiple to 10″ in the apparent diſtance and making an equal alteration in the reſult. In the above example, the diſtance for calculation might be 86° 10′ 20″; and then one ſecond ſhould be deducted from the reſult, which would have been 85° 42′ 59″.

Example II.—According to the method given by Dr. Maſkelyne in the Preface to Taylor's Logarithms. Let the apparent altitude of the moon's centre be 39° 3′ 4″, that of the ſun 32° 34′ 47″; their apparent diſtance 86° 10′ 19″, and the moon's horizontal parallax 58′ 28″. Required the true diſtance of the ſun and moon.

☽'s horizontal parallax - - -	0° 58′ 28″	Log. ſine - - -	8.23061
☽'s apparent altitude - - -	39 3 4	Log. coſine - -	9.89019
☽'s parallax in altitude - -	0 45 24	Log. ſine - -	8.12080
☽'s refraction from Table I. - -	− 1 10		
Correction of moon's altitude - -	0 44 14		
☽'s apparent altitude - - -	39 3 4		
☽'s true altitude - - -	39 47 18		
⊙'s apparent altitude - - -	32 34 47		
Difference of refraction and parallax -	0 1 22		
⊙'s true altitude - - -	32 33 25		
☽'s true altitude - - -	39 47 18		
Difference of true altitudes of ⊙ and ☽ -	7 13 53		
⊙'s apparent altitude - - -	32 34 47		
☽'s apparent altitude - - -	39 3 4		
Difference of apparent altitudes of ⊙ and ☽	6 28 17		
Apparent diſtance - - - -	86 10 19		
Sum - - - - -	92 38 36		

Difference	79 42 2		
Half ſum	46 19 18	Log. ſine	9.8592754
Half difference	39 51 1	Log. ſine	9.8067114
☽'s apparent altitude	39 3 4	Co. ar. log. coſine	0.1098114
☽'s true altitude	39 47 18	Log. coſine	9.8855952
☉'s apparent altitude	32 34 47	Co. ar. log. coſine	0.0743564
☉'s true altitude	32 33 25	Log. coſine	9.9257539
			2)39.6675037
			19.8307518
Half difference of true altitudes of ☉ and ☽	3 36 56	Log. ſine	8.7997641
		Log. tangent of an arc	11.9309877 Tang. N.
		Correſponding log. coſine N	9.9981254
	42 51 29	Log. ſine	9.8326264
	2		
	85 42 58	True diſtance required.	

The formula for the above method is nearly ſimilar to that of Borda. It is,

$$\frac{1}{\text{ſin. }\frac{1}{2}\,(A \backsim H)}\;\frac{\sqrt{\text{ſin. }\frac{1}{2}\,(d\,(a \backsim b)\ \text{ſin. }\frac{1}{2}\,(d-(a \backsim b)\ \text{coſ. A coſ. H}}}{\text{coſ. }a\ \ \text{coſ. }b} = \text{tang. N, and ſin. }\tfrac{1}{2}\,\text{D} = \frac{\text{ſin. }\frac{1}{2}\,(A \backsim H)}{\text{coſ. N.}},$$

Example III.—Dunthorn's Method.—Let the apparent diſtance of the ſun and moon be 86° 10′ 19″, the apparent altitude of the ſun 32° 34′ 47″, that of the moon 39° 3′ 4″, and her horizontal parallax 58′ 28″. What is their true diſtance?

		Log. from Table IX.	9.995526
		Log. from Table X.	10
		Reſerved logarithm	9.995516
		Cor. ☽'s altitude, Table VIII.	0 44′ 14″
Moon's apparent altitude	39° 3′ 4″	Cor. ☉'s altitude, Tables I. and II.	0 1 22
Sun's apparent altitude	32 32 37		
		Cor. apparent altitude	0 45 36
Difference of apparent altitudes	6 28 17		6 28 17
Apparent diſtance	86 10 19		
		Half difference true altitude	7 14 53
		Half difference true altitude	3 37 26
Sum	92 38 36 :	its half is 46° 19′ 18″ S.	9.859275
Difference	79 42 2 :	its half is 39 51 1 S.	9.806711
		Reſerved logarithm	9.995516
Half difference true altitude	3 36 56		2)19.661502
Arc	42 37 46		9.830751
Sum	46 14 42	Coſine	9.839840
Difference	39 0 50	Coſine	9.890417
			2)19.730257
Half true diſtance	42 51 24	Coſine	9.865128
	2		
True diſtance	85 42 58		

Example IV.—By Mendoza's Method.

⊙'s altitude 32° 35′. ☾'s altitude 39 3′. Apparent diſtance 86° 10′ 19″. Horizontal parallax 58′ 28″.

Sun's altitude - - -	32° 35′ 0″				
Moon's altitude - - -	39 3 0	Table X.			
Sum of app. altitudes of ⊙ and ☽	71 38 0	No. 1.	88083		
Compl. corr. Table VII. -	58 39		59	Table IX.	
Corr. moon's alt. Table VIII. -	43 52	No. 2.	32		20 9
Prop. part - - -	22	No. 3.	11		10
					3
Corrected ſum of altitudes - -	73 20 53	No. 2.	03202		
				Aux. arg.	20 22
Apparent diſtance - -	86 10 0	No. 3.	33820		
	85 42 38.5	No. 4.	25207		
Seconds reſerved	19.		021		
True diſtance	85 42 57.5		186		

This method is not only extremely ſhort and eaſy, but is exempt from any poſſible confuſion of ſigns, all the corrections being additive. It is really ſo perfect, that it ſhould ſuperſede every other now in uſe.

Mr. Mendoza's formula is

$$\text{Sin. ver. } D + 4 = \left\{ \begin{array}{ll} \text{ſin. ver. } (A + H) + \text{ſin. ver. } (d + M) + \text{ſin. ver. } (d \backsim M) & = P \\ + \text{ſin. ver. } (a + h + M) + \text{ſin. ver. } ((a + h) \backsim M) & = Q \end{array} \right.$$

$$2 \text{ coſ. } M \text{ being taken} = \frac{\text{oſ. } A \ \text{ coſ. } H}{\text{coſ. } a \ \text{ coſ. } h}$$

The operation performed by his tables is as follows:

Obſerved altitude ⊙ - - -	h	
Ditto ☽ - - -	a	
Sum - - - -	$a + h$	
With h in Table VI. take -	$60' - r + p$	r = refract. p = parallax.
—— d - take M and -	$r - p$	
The ſum - - -	A + H	

With $(a + h)$ and M in Table XI.	take Number	I = Q
—— (A + H) - - XI.	- - .	II = ſin. ver. (180° − (A + H) − 59′)
—— d and M - - XI.	- -	III = ſin. ver. $(d + M)$ + ſin. ver. $(d \backsim M)$

The ſum or number IV = ſin. ver. D + 4 = I + II + III = IV

Example V.

By the method propoſed in the Appendix of the requiſite Tables publiſhed by Dr. Maſkelyne a very ſhort time before his death. A very good table of verſed ſines accompanies it.

The apparent diſtance of the moon's centre from the ſun's centre being 86 10′ 19″; the apparent altitude of the ſun's centre 32° 34′ 47″; the apparent altitude of the moon's centre 39 3′ 4″; and the moon's horizontal parallax 58′ 28″; required the diſtance of their centres.

☽'s horizontal parallax	0° 58′ 28″		
⊙'s apparent altitude	32 34 47	− 1′ 22″	45′ 36″ whole correction.
☽'s apparent altitude	39 3 4	+ 44 14	
Difference of app. altitude	6 28 17	N. verſ.	006373
Apparent diſtance	86 10 19	N. verſ.	933237
			926864
		Nat. No. to log.	919344
Difference of true altitudes	7 14 53	N. verſ.	007989
True diſtance -	85 43 3	N. verſ.	925333

Table IX.	9.995526
Table X.	10
Reſerved logarithm	9.995516
Logarithm -	5.967016
Logarithm -	5.962532

Example I.—Mackay's Method, which is the ſame as the preceding.

Let the apparent diſtance between the centres of the ſun and moon be 86° 10′ 19″; the apparent altitude of the ſun 32° 34′ 47″; the apparent altitude of the moon 39° 3′ 4″; and the moon's horizontal parallax 58′ 28″.

Apparent diſtance	-	86° 10′ 19″	N.V.S.	933237		
Difference of apparent altitude		6 28 17	N.V.S.	006373	Log. diff. Tab. XLII.	9.995517
					Log.	5.967010
Corrected ☽'s altitude	-	+ 44 14	Diff.	926864		
Corrected ☉'s altitude	-	+ 1 22	N. No.	917333		5.962527
Difference of true altitude	-	7 14 53	N.V.S.	007989		
True diſtance	- -	85 43 2	N.V.S.	925322		

This is a ſhort and very excellent method, in caſe the mariner ſhould not poſſeſs Mendoza's tables.

Example by Mr. Turner's Method.

			Table XV. of Nautical Almanac.					
Horizontal parallax	-	0° 58′ 28″	Prop. log.	-	4884	Prop. log.	58′ 28″	4884
Moon's altitude	- -	39 3 4	Coſecant	-	-	-		10.2006
Sun's altitude	- -	32 34 47	Coſecant	-	10.2687			
Apparent diſtance	- -	86 10 19						
Firſt correction from the Tables		1 47						
Firſt corrected diſtance	-	86 12 6	Sine	- -	9.9990	Tang.	86 12 6	11.1777
Second correction	-	— 29 7	Prop. log. 31′ 34″		0.7561	Prop. log.	2 27	1.8667
Second corrected diſtance	-	85 42 59	2d Part 2 27					
			29 7	2d Correction.				

This method was publiſhed in a very ſmall volume by the author at Portſmouth.

Apparent diſtance 86° 10′ 19″ Hor. par. 58′ 28″ ☉'s apparent altitude 32° 34′ 47″.
☽'s apparent altitude 39 3 4

By Garrard's Tablets.

No. II.	1.2900	— Hor. par. 0° 58′ 28″ ☽'s app. altitude	39° 3′ 4″ + 44′ 14″	45′ 35″ — Pro. log.	0.5964
No. II. Suppl.	9.9546	☉'s app. altitude	32 34 47 — 1 21		
	1 39 22	No. I. -	6 28 17	22 47	
			+ 22 47		
			6 51 4	Argument B. No. III.	1.7139
9.2076	0 6 41	No. I. app. diſt.	86 10 19	Complement No. III.	9.2076
0.2883 pr. log.	1 32 41			+ 5′ 27″¾ =	1,5179
0.7405 = prop. log.	— 32′ 43″ + 5 27¾		— 27 15¼		
			85 43 3¾		

This method, by a ſmall ſet of tablets, has lately been publiſhed by Mr. W. Garrard, of the Naval Aſylum, Greenwich.

There is a formula in Keith's Trigonometry, which might be ſimplified and reduced to the following method.

Apparent diſtance 86° 10′ 19″	-	Nat. coſ.	066762			
Difference of apparent altitudes	-	Nat. coſ.	993629			
		Difference	926867	-	Log.	5.9670174
Log. diff., or reſerved logarithm, Table IX. reg. tab. or Table XLII. of Mackay	- - - -			-	Log.	9.9955169
		Nat. num.	917349	-	Sum	5.9625343
Difference of true altitudes	- -	Nat. coſ.	992043			
True diſtance 85° 42′ 59″	-	Nat. coſ.	074694			

In this example the log. diff., taken from Mackay's Table XLII. is ſubſtituted for the following logarithms, which are uſed by the author, and are indeed common to all the formulæ of this nature.

Log. ſecant of apparent altitude ⊙	0.0743564
Log. ſecant of apparent altitude ☽	0.1098114
Log. coſine of true altitude ⊙	9.9257539
Log. coſine of true altitude ☽	9.8855952
Sum	9.9955169

This ſum is the reſerved logarithm of Requiſite Tables, and that of Table XLII. of Mackay.

Another Example by Borda's method.

Apparent altitude ⊙	42° 3′ 20″		
Correction R — P	— 56		
⊙'s true altitude	42 2 24		
Apparent altitude ☽	26 10 15	Log. coſine	0.9530262
Horizontal parallax	56 31.5	Log. ſine	8.2159471
Parallax of ☽ in altitude	+ 50 43.5		
Refraction	— 1 55		8.1689733
Correction of ☽'s altitude	+ 48 48.5		
☽'s true altitude	26 52 3.5		

	° ′ ″		
Apparent diſtance ⊙ ☽	100 8 20		
Apparent altitude ⊙	42 3 20	Co. ar. log. coſ.	0.1293061
Apparent altitude ☽	26 10 15	Co. ar. log. coſ.	0.0469738
Sum	168 21 55		

Half ſum	84° 10′ 57.5″	Log. coſ.	9.0058673	
Diſtance — ½ ſum	15 57 23.5	Log. coſ.	9.9829357	
True altitude ⊙	42 2 24	Log. coſ.	9.8708003	
True altitude ☽	26 59 3.5	Log. coſ.	9.9499415	
Sum of true altitudes	69 1 27.5	Sum	2)38.9888247	
		Half ſum	19.4929123	Diff. = 9.5769816 ſin. < N
Half ſum	34 30 43.7	Log. coſ. A	9.9159307	
		Log. coſ. N	9.9666044	
Half true diſtance	49 43 52 2	Log. ſin.	9.8825351	
True diſtance	99 27 44			

Type of Mendoza's Method. Same Example

⊙'s Apparent altitude	42° 3′ 0″	Apparent diſtance ⊙ ☽	100° 8′ 20.0″
☽'s Apparent altitude	26 10 0	Horizontal parallax	56 31.5

Sum	68 13 0	I	31335 102	Table IX.	Auxiliary Argument.
Correction ⊙ Table VII.	59 4				Table IX.
Correction ☽ Table VIII.	48 20				
Proportional part	28.5				
Sum of corrected altitudes	70 0 52.5	II	58096 34		13 21.0 8.5 3.5
Apparent diſtance ⊙ ☽	100 8 20.0	III	74697 41		13 33.0
Reſerved ſeconds	99 27 25 + 20	IV	16.4305 4187		
True diſtance	99 27 45		118		

Same Example by verſed Sines.

Type for this Method.

	Apparent Altitudes.	Correction for Refraction and Parallax	True Altitudes.		
	° ′ ″	′ ″	° ′ ″		° ′ ″
☉	42 3 20	− 0 56	42 2 24	Apparent diſtance ☉ ☽	100 8 20
☽	26 10 15	+ 48 48	26 59 3	Horizontal parallax	56 31
Difference - -	-	- -	15 3 21		
Difference - -	15 53 5	N.V.S.	038185		
	100 8 20	N.V.S.	1176035	Reſerved logarithm	9.9970217
				Logarithm -	6.0560851
		Difference	1137850		6.0531068
		Nat. N.	1130075		
Difference of true altitudes	15 3 21	N.V.S.	034327		
True diſtance -	99 27 45	N.V.S.	164402		

The reſerved logarithm 9.9970217 is the logarithm of 0 993164, which is twice 0.496582, the natural coſine of 60° 13′ 33″, the auxiliary angle M in Mendoza's formula.

Another Example by Mendoza's Tables.

☉'s Apparent altitude	6° 27′ 30″			Apparent diſtance ☉ ☽	108° 42′ 3″
☽'s Apparent altitude	54 11 57			Horizontal parallax	0 55 19
Sum - -	60 39	I	15795 224	Table X.	Auxiliary argument.
Correction ☉ Table VII.	52 14				Table IX.
Correction ☽ Table VIII.	31 29				
Proportional part -	11				
Sum of corrected altitudes	62 2 54	II	84046 26		24 42 9 3
Apparent diſtance ☉ ☽	108 42	III	16566 16		
					24 54
	108 27 42	IV	16673 477		
Reſerved ſeconds -	3				
True diſtance -	108 27 45		196		

The above example by direct calculation from M. Mendoza's formulæ, would ſtand thus:

Apparent diſtance -	108° 42′ 3″	Horizontal parallax - -	55′ 19″
Apparent altitude ☉ -	6 27 30 = b	Apparent altitude ☽ - -	54 11 57 a
Correction $p - r$ - -	7 46	Correction $p - r$ - -	+ 31 41
	6 19 44 = H		54 53 38 A.

$- a + b$

$a + b = 60^\circ\ 39'\ 27''$

$M = 60\ \ 24\ \ 54$

$(a + b) + M$	=	121	4	21	N.V.S.	1.516122	1.516132 = N° I.
$(a + b) - M$	=	0	14	33	N.V.S.	0.000010	
A + H	=	61	3	22	N.S.V.S.	1.483953	= 1.483953 = N° II.
$d + M$	=	169	6	57	N.V.S.	1.982011	1.316596 N° III.
$d - M$	=	48	17	9	N.V.S.	0.334585	
						5.316681	
						4	
True Diſtance		108	27	45		1.316681	

If the proportional part for ſeconds of apparent altitudes be taken from the tables, the analogy with the above will be apparent.

☉'s Apparent altitude - -	6° 27′ 30″	Apparent diſtance ☉ ☽ -	108° 42′ 3″		
☽'s Apparent altitude - -	54 11 27	Horizontal parallax - -	0 55 19		
Sum of apparent altitudes -	60 39 27	I. -	15725	=	16132
Correction for ☉ Table VII. -	52 14	Proportional part	224		
Ditto for ☽ Table VII. -	31 29	Proportional part	113		
Proportional part - - -	12				
Sum of corrected altitudes - -	62 3 22	II. - -	83792	=	83954
		- -	162		
Apparent diſtance - - -	108 42 3	III. - -	16566	=	16582
		- -	16		
	108 27 42		16668		16668
Reſerved ſeconds - -	3		16477		
True diſtance - - -	108 27 45		191		

The following approximate method, by means of the ſmall triangles, (*Plate* XVII. *Aſtronomy*, *fig.* 1.) is computed without any auxiliary tables, by this formula.

Correction $Y = q \text{ coſ. } S - p \text{ coſ. } L.$

$$\text{And ſin. } \tfrac{1}{2} L = \sqrt{\left(\frac{\text{coſ. } \frac{1}{2} (D - a + b) \text{ ſin. } \frac{1}{2} (D + a - b)}{\text{coſ. } a \text{ ſin. } D}\right.}$$

$$\text{ſin. } \tfrac{1}{2} S = \sqrt{\left(\frac{\text{coſ. } \frac{1}{2} (D + a + b) \text{ ſin. } \frac{1}{2} (D + b - a)}{\text{coſ. } b \text{ ſin. } D.}\right.}$$

D = apparent diſtance.

a = apparent altitude ☽.

b = apparent altitude ☉.

Let the apparent diſtance ☉ ☽ be 108° 42′ 3″; apparent altitude ☉ 6° 27′ 30″; apparent altitude ☽ 54° 12′; refraction — parallax 7′ 43″ for the ☉; and parallax — refraction 31′ 42″ for the ☽. Required the true diſtance.

Computation of the angle S at the centre of the Sun.				Computation of the angle L at the centre of the Moon.	
App. diſt. ☉ ☽	108° 42′ 0″	com. ar. log. ſin.	0.02355	- - - - - -	0.02355
App. alt. ☉	6 27 30	com. ar. log. coſ.	0.00277		
App. alt. ☽	54 12 0	- - - -		- - - com. ar. log. coſ.	0.23287
Sum -	169 21 30				
Half ſum -	84 40 50	log. coſ.	8.96712	- - - - - -	8.96712
Half ſum — ap. alt. ☽	30 28 50	log. ſin.	9.70522	Half ſum — app. alt. ☉ 78° 13′ 10″ log ſin.	9.99075
		Sum	18.69866	Sum	19.21429
		Half ſum	9.34933	Half ſum	9.60715
which is log. ſin. ½ S =	12 55′ 0″			which is log. ſin. ½ L = 23° 52′ 25″	
therefore S =	25 50 0	log. coſ.	9.95430	therefore L = 47 44 50 log. coſ.	9.82763
Ref. — par. of ☉ =	463″	log.	2.66558	Par. — refr. ☽ = 1902″ log.	3.27921
		Carried forward Sum	2.61988	Carried forward Sum	3.10684

Brought forward 3.10684 Log. of p coſ. L = 1279″ = 21′ 19″ −
Brought forward 2.61988 log. of q coſ. S - = 417 = 6 57 +

Difference 14 22 − = Y
Or total correction required.

Apparent diſtance ⊙ ☽ - - 108° 42′ 3″
Exceſs of this diſtance above the reduced 14 22

Diſtance reduced ⊙ ☽ - - 108 27 41

The only advantage of this method is that it requires only a table of logarithms to five places.

The true diſtance being thus determined, it only remains to find the correſponding time at Greenwich, and to compare it with that found on board the ſhip. This latter may be found from the altitude of the ſun at the moment of obſervation: but it may happen that the ſun is not favourably ſituated at this moment, in which caſe, and indeed generally, the time had better be deduced from ſolar obſervations made expreſsly for the purpoſe; and which, with a good chronometer, may even be made two or three days before or after the obſervations for the longitude, if cloudy weather ſhould prevent others being made at a ſhorter interval; only it muſt be remembered, that the deduced longitude will correſpond with that of the place where the error of the chronometer is determined, and not for the place of obſervation.

The inſtruments uſed for theſe lunar obſervations are ſextants and reflecting circles. Under CIRCLE we have already deſcribed the reflecting circle of Mr. Troughton's conſtruction, which we conceive to be vaſtly ſuperior to any ſextant for obtaining with accuracy the angle ſubtended by the moon and ſtar. As each obſervation has three readings, two obſervations (one on each ſide) of zero, give ſix reſults. This inſtrument, in the hands of a careful obſerver, will not give a greater error than 20″, or about ten geographical miles at the equator. The error of the lunar tables may amount to about as much more, and an error in the altitudes and other data, about the ſame quantity. Should all theſe conſpire to produce a total error in the ſame direction, this total error would amount to 60″, or 30 miles. We truſt, therefore, that the advantage and importance of this method will every day be more and more appreciated; and that the time will come when no naval officer or mariner of tolerable education will be found ignorant of it. With Mendoza's tables, a circle of the above deſcription, and a good chronometer, the longitude may always be determined within thirty miles, and generally within leſs.

Some perſons ſtill prefer ſextants, from an opinion that they derive ſome advantage from length of radius; but they are ſubject to errors which have no tendency to correct each other, and ſhould only be uſed for the altitudes, and the circle to be taken in preference for the obſervations of the diſtance. When circumſtances do not admit of three obſervers, the altitudes of the ſun and moon may be computed, and we are diſpoſed to think that this would always be the more preferable method, where the obſerver is ſufficiently ſkilful to make the additional computation without fear of miſtakes. The altitudes found in this caſe by computing the horary angles are the true altitudes, and muſt be corrected by applying the refraction and parallax *inverſely*, but for doing this accurately, tables ſhould be computed for reducing *true diſtances* to *apparent*. However, a little attention to this circumſtance will render the whole operation ſufficiently eaſy, and if the computations are well made, the accuracy of this method will probably exceed that of direct obſervation. For the method of making theſe computations, ſee Mendoza's Tables, Requiſite Tables, &c. Mackay's Longitude, &c. &c.

LONGITUDE.

A Table containing the Latitudes of Places, with their Longitudes from the Meridian of the Royal Obſervatory at Greenwich; alſo the Time of High Water at the Full and Change of the Moon, at thoſe Places where it is known.

Names of Places.	Continents.	Coaſt, Sea, or Country.	Latitude.	Longitude In Degrees.	Longitude In Time.	H. W.
			° ′ ″	° ′ ″	H. M. S.	H. M.
Aalborg	Europe	Denmark	57 2 57 N.	9 56 30 E.	0 39 46 E.	
Aarhuus	Europe	Denmark	56 9 35 N.	10 14 0 E.	0 40 56 E.	
Abbeville	Europe	France	50 7 4 N.	1 49 45 E.	0 7 19 E.	0 45
Aberdeen	Europe	Scotland	57 5 0 N.	2 21 30 W.	0 9 26 W.	
Abo	Europe	Finland	60 27 7 N.	22 15 00 E.	1 29 00 E.	10 30
Acheen Head	Aſia	Sumatra	5 22 0 N.	95 26 0 E.	6 21 44 E.	
Adventure (Bay)	Aſia	New Holland	43 21 20 S.	147 31 40 E.	9 50 7 E.	
Adventure (Iſle)	America	Pacific Ocean	17 5 15 S.	144 17 45 W.	9 37 11 W.	
Aerſchot	Europe	Netherlands	50 59 15 N.	4 49 31 E.	0 19 18 E.	
Agde	Europe	France	43 18 43 N.	3 27 55 E.	0 13 52 E.	
Agen	Europe	France	44 12 22 N.	0 36 20 E.	0 2 25 E.	
Agimere	Aſia	Agimere	26 35 0 N.	75 20 0 E.	5 1 20 E.	
St. Agnes (Lights)	Europe	Scillies	49 53 47 N.	6 20 30 W.	0 25 22 W.	
Agra	Aſia	India	27 12 30 N.	78 17 0 E.	5 13 08 E.	
Agria	Europe	Hungary	47 53 54 N.	20 22 0 E.	1 21 28 E.	
Aguada (Point)	Aſia	India	15 28 55 N.	73 48 39 E.	4 55 15 E.	
Aire	Europe	France	43 41 52 N.	0 15 45 W.	0 1 3 W.	
Aix	Europe	France	43 31 48 N.	5 26 30 E.	0 21 46 E.	
Aix (Iſle)	Europe	France	46 1 38 N.	1 11 0 W.	0 4 44 W.	
Akerman	Europe	Turkey	46 11 58 N.	30 43 45 E.	2 2 55 E.	
Alais	Europe	France	44 7 22 N.	0 35 50 E.	0 2 23 E.	
Albano	Europe	Italy	41 43 50 N.	12 38 0 E.	0 50 32 E.	
Albany	America	New Wales	52 14 41 N.	81 52 50 W.	5 27 31 W.	
Alby	Europe	France	43 55 36 N.	2 8 18 E.	0 8 33 E.	
Aleppo	Aſia	Turkey	36 11 25 N.	37 10 0 E.	2 28 40 E.	
Alexandretta	Aſia	Syria	36 34 47 N.	36 14 45 E.	2 24 59 E.	
Alexandria	Africa	Egypt	31 11 20 N.	30 10 15 E.	2 0 41 E.	
Alez	Europe	France	42 59 50 N.	2 15 0 E.	0 9 0 E.	
Algiers	Africa	Algiers	36 49 30 N.	2 12 45 E.	0 8 51 E.	
Alkmaer	Europe	Holland	52 38 34 N.	4 38 0 E.	0 18 32 E.	
Aloſt	Europe	Netherlands	50 56 18 N.	4 1 58 E.	0 16 8 E.	
Altengaard	Europe	Lapland	69 55 0 N.	23 4 0 E.	1 32 16 E.	
Ambrym (Iſle)	Aſia	Pacific Ocean	16 9 30 S.	168 12 30 E.	11 12 50 E.	
Ameſbury	Europe	England	51 10 19 N.	1 46 37 W.	0 7 6 W.	
Amiens	Europe	France	49 53 38 N.	2 17 56 E.	0 9 12 E.	
Amſterdam	Europe	Holland	52 21 56 N.	4 51 30 E.	0 19 26 E.	3 0
Amſterdam (Har.)	America	Curazao	12 8 0 N.	68 20 30 W.	4 33 22 W.	
Amſterdam (Iſle)	Aſia	Indian Ocean	37 51 0 S.	77 44 0 E.	5 10 56 E.	
Anadirſkoi Noſs	Aſia	Beering's Straits	64 14 30 N.	173 31 0 W.	11 34 4 W.	
Ancona	Europe	Italy	43 37 54 N.	13 30 30 E.	0 54 2 E.	
Andaman (Little)	Aſia	Bengal Bay	10 40 0 N.	92 24 0 E.	6 9 36 E.	
Anderſon's Iſland	America	Beering's Straits	63 4 0 N.	167 38 0 W.	11 10 32 W.	
Angenga	Aſia	India	8 39 25 N.	76 50 4 E.	5 7 20 E.	
Anger Point	Aſia	Java	6 3 17 S.	106 1 57 E.	7 4 8 E.	
Angers	Europe	France	47 28 8 N.	0 33 52 W.	0 2 15 W.	
Angouleme	Europe	France	45 39 3 N.	0 8 47 E.	0 0 35 E.	
Angra	Europe	Tercera	38 39 7 N.	27 12 42 W.	1 48 51 W.	
C. Angra Pequena	Africa	Caffraria	26 36 50 S.	15 16 30 E.	1 1 6 E.	
Anholt (Light)	Europe	Categat	56 44 20 N.	11 40 0 E.	0 46 40 E.	
St. Ann (Cape)	Africa	Sierra Leone	7 7 30 N.	12 22 0 W.	0 49 28 W.	

A Table of the Latitudes and Longitudes of Places.

Names of Places.	Continents.	Coaſt, Sea, or Country.	Latitnde.	Longitude In Degrees.	Longitude In Time.	H. W.
			° ′ ″	° ′ ″	H. M. S.	H. M.
Annamaboe	Africa	Gold Coaſt	5 9 52 N.	1 39 4 W.	0 6 36 W.	
Annamocka	Aſia	Pacific Ocean	20 15 20 S.	174 45 0 W.	11 39 0 W.	6 0
Annobona	Africa	Atlantic Ocean	1 25 0 S.	5 45 0 E.	0 23 0 E.	
St. Anthony's (Cape)	America	Staten Land	54 46 45 S.			
Antibes	Europe	France	43 34 43 N.	7 7 20 E.	0 28 29 E.	
Antigua (St. John's)	America	Caribbean Sea	17 4 30 N.	62 9 0 W.	4 8 36 W.	
Anton. Gill's Bay	Africa	Madagaſcar	15 27 23 S.	50 23 15 E.	3 21 33 E.	
Antwerp	Europe	Flanders	51 13 18 N.	4 24 15 E.	0 17 37 E.	6 0
Aor (Pulo)	Aſia	Chineſe Seas	2 45 0 N.	104 40 20 E.	6 58 41 E.	
Apæ (Iſle)	Aſia	Pacific Ocean	16 46 15 S.	168 27 30 E.	11 13 50 E.	
Appenrade	Europe	Denmark	55 2 57 N.	9 26 4 E.	0 37 44 E.	
C. Appollonia	Africa	Gold Coaſt	4 59 12 N.	3 10 11 W.	0 12 41 W.	
F. Appollonia	Africa	Gold Coaſt	4 59 14 N.	3 4 37 W.	0 12 18 W.	
Apt	Europe	France	43 52 29 N.	5 23 37 E.	0 21 34 E.	
Aracta	Aſia	Turkey	36 1 0 N.	38 50 0 E.	2 35 20 E.	
Arakootai Iſle	America	Pacific Ocean	20 1 30 S.	158 14 30 W.	10 32 58 W.	
Archangel	Europe	Ruſſia	64 34 0 N.	38 54 30 E.	2 35 38 E.	6 0
Arcot	Aſia	Arcot	12 51 24 N.	79 28 4 E.	5 17 52 E.	
Arenſburg	Europe	Baltic	58 15 9 N.	22 13 15 E.	1 28 53 E.	
Arica	America	Peru	18 26 40 S.	71 13 0 W.	4 44 52 W.	
Arles	Europe	France	43 40 28 N.	4 37 24 E.	0 18 30 E.	
Arras	Europe	France	50 17 37 N.	2 45 41 E.	0 11 3 E.	
Aruba (W. End)	America	Leeward Iſles	12 35 30 N.	69 29 45 W.	4 37 59 W.	
Aſcenſion (Iſle)	Africa	S. Atlantic Ocean	7 56 30 S.	14 21 15 W.	0 57 25 W.	
Aſſiſſi	Europe	Italy	43 4 22 N.	12 35 13 E.	0 50 21 E.	
Aſtracan	Aſia	Siberia	46 21 12 N.	48 2 45 E.	3 12 11 E.	
Ath	Europe	Netherlands	50 42 17 N.	3 46 17 E.	0 15 5 E.	
Athens	Europe	Turkey	38 5 0 N.	23 52 30 E.	1 35 30 E.	
Atooi	America	Sandwich Iſles	21 57 0 N.	159 39 30 W.	10 38 38 W.	
Auch	Europe	France	43 38 39 N.	0 34 36 E.	0 2 18 E.	
Aveiro	Europe	Portugal	40 38 17 N.	8 29 15 W.	0 33 57 W.	
St. Auguſtin (Bay)	Africa	Madagaſcar	23 27 52 S.	44 9 0 E.	2 56 36 E.	
Avignon	Europe	France	43 56 58 N.	4 48 10 E.	0 19 13 E.	
Avranches	Europe	France	48 41 21 N.	1 21 51 W.	0 5 27 W.	6 00
Aurillac	Europe	France	44 55 10 N.	2 27 0 W.	0 9 48 W.	
Aurora (Iſle)	Aſia	Pacific Ocean	15 8 0 S.	168 17 0 E.	11 13 8 E.	
Autun	Europe	France	46 56 48 N.	4 17 44 E.	0 17 11 E.	
Auxerre	Europe	France	47 47 57 N.	3 34 06 E.	0 14 16 E.	
Awatſcha	Aſia	Kamtchatka	53 0 39 N.	158 44 30 E.	10 34 58 E.	4 36
Babee (Pulo)	Aſia	Straits of Sunda	5 45 0 N.	106 20 30 E.	7 5 22 E.	
Babylon (Ancient)	Aſia	Meſopotamia	33 0 0 N.	42 46 30 E.	2 51 6 E.	
Bagdad	Aſia	Meſopotamia	33 19 40 N.	44 22 15 E.	2 57 29 E.	
Ballabea (Iſle)	Aſia	New Caledonia	20 7 0 S.	164 22 0 E.	10 57 28 E.	
Ballaſore	Aſia	India	21 20 0 N.	87 1 26 E.	5 48 6 E.	
Banana (Big)	Africa	Sierra Leone	8 5 30 N.	13 5 0 W.	0 52 20 W.	
Bancoot	Aſia	India	17 56 40 N.	73 7 54 E.	4 52 32 E.	
Bangalore	Aſia	Myſore	13 0 0 N.	77 37 10 E.	5 10 29 E.	
Banguey (Peak)	Aſia	Malacca	7 18 0 N.	117 17 30 E.	7 49 10 E.	
Bank's Iſle	Aſia	New Zeeland	43 43 0 S.	173 3 55 E.	11 32 16 E.	

A Table of the Latitudes and Longitudes of Places.

Names of Places.	Continents.	Coaſt, Sea, or Country.	Latitude.	Longitude		H. W.
				In Degrees.	In Time.	
			° ′ ″	° ′ ″	H. M. S.	H. M.
Banſtead	Europe	England	51 19 25 N.	0 11 20 W.	0 0 45 W.	
Bantam Point	Aſia	Java	5 50 20 S.	106 9 3 E.	7 4 36 E.	
Barbas (Cape)	Africa	Sanhaga	22 15 30 N.	16 40 0 W.	1 6 40 W.	
Barbuda (Iſle)	America	Atlantic Ocean	17 49 45 N.	61 50 0 W.	4 7 20 W.	
Barcelona	Europe	Spain	41 26 0 N.	2 13 0 E.	0 8 52 E.	
Barfleur (Cape)	Europe	France	49 40 21 N.	1 15 36 W.	0 5 2 W.	7 30
Barlingues	Europe	Portugal	39 26 0 N.	9 35 20 W.	0 38 21 W.	
Barnevelt's (Iſle)	America	Terra del Fuego	55 49 0 S.	66 58 0 W.	4 27 52 W.	
Barren Iſle	Aſia	Bay of Bengal	12 14 0 N.	93 42 0 E.	6 14 48 E.	
St. Bartholomew (Iſle)	Aſia	New Hebrides	15 42 0 S.	167 17 30 E.	11 9 10 E.	
Baſle	Europe	Switzerland	47 33 34 N.	7 35 12 E.	0 30 21 E.	
Baſſa Terre	America	Guadaloupe	15 59 45 N.	62 0 45 W.	4 8 3 W.	
Baſſeen (Fort)	Aſia	India	19 19 0 N.	72 55 24 E.	4 51 42 E.	
Baſſes (Great)	Aſia	Ceylon	6 7 30 N.	81 42 50 E.	5 26 51 E.	
Batavia	Aſia	Java	6 11 0 S.	106 50 0 E.	7 7 20 E.	
Bath	Europe	England	51 22 30 N.	2 21 30 W.	0 9 26 W.	
Batterſea	Europe	England	51 28 36 N.	0 10 24 W.	0 0 42 W.	
Bauld (Cape)	America	Newfoundland	51 39 45 N.	55 27 50 W.	3 41 51 W.	
Bayeux	Europe	France	49 16 34 N.	0 42 11 W.	6 2 49 W.	
Bayonne	Europe	France	43 29 15 N.	1 28 41 W.	0 5 55 W.	3 30
Bazas	Europe	France	44 26 0 N.	0 13 17 W.	0 0 53 W.	
Beachy Head	Europe	England	50 44 24 N.	0 15 12 E.	0 1 1 E.	10 30
Bear (Iſle)	America	Hudſon's Bay	54 34 0 N.	79 56 0 W.	5 19 44 W.	12 0
Beauvais	Europe	France	49 26 0 N.	2 4 41 E.	0 8 19 E.	
Beering's Iſland	Aſia	Beering's Straits	55 36 0 N.	167 46 0 E.	11 11 4 E.	
Belle Iſle	Europe	France	47 17 17 N.	3 5 0 W.	0 12 20 W.	1 30
Belley	Europe	France	45 45 29 N.	5 41 4 E.	0 22 44 E.	
Bembridge Point	Europe	Iſle of Wight	50 40 59 N.	1 3 26 W.	0 4 14 W.	
Bencoolen	Aſia	Sumatra	3 49 9 S.	102 2 25 E.	6 48 10 E.	
Bender	Europe	Turkey	46 50 29 N.	29 36 0 E.	1 58 24 E.	
Berg. River	Africa	St. Helen's Bay	32 50 47 S.	18 12 0 E.	1 12 48 E.	
Bergen	Europe	Norway	60 23 40 N.	5 11 30 E.	0 20 46 E.	1 30
Bergen-op-zoom	Europe	Holland	51 29 46 N.	4 16 57 E.	0 17 8 E.	
Berlin	Europe	Germany	52 31 30 N.	13 23 0 E.	0 53 32 E.	
Bermudas (Iſle)	America	Atlantic Ocean	32 35 0 N.	63 28 0 W.	4 13 52 W.	7 0
Bernaul	Aſia	Siberia	53 19 59 N.	82 12 15 E.	5 28 49 E.	
St. Bertrand	Europe	France	43 1 27 N.	0 34 4 E.	0 2 16 E.	
Beſançon	Europe	France	47 14 12 N.	6 2 46 E.	0 24 11 E.	
Beſſeſted	Europe	Iceland	64 6 9 N.	21 53 45 W.	1 27 35 W.	
Bexhill	Europe	England	50 50 47 N.	0 28 43 E.	0 1 55 E.	
Beziers	Europe	France	43 20 23 N.	3 12 24 E.	0 12 50 E.	
Bird Iſland	America	Pacific Ocean	17 49 0 S.	142 43 24 W.	9 30 54 W.	
Bitche	Europe	Lorrain	49 2 21 N.	7 26 20 E.	0 29 45 E.	
Blanco (Cape)	Africa	Negroland	20 55 30 N.	17 10 0 W.	1 8 40 W.	9 45
Blanco (Cape)	America	Patagonia	47 20 0 S.	64 42 0 W.	4 18 48 W.	
Blanco (Cape)	America	Pacific Ocean	43 12 0 N.	124 7 30 W.	8 16 30 W.	
Bligh's Cape	Aſia	Kerguelen's Land	48 29 30 S.	68 38 45 E.	4 34 35 E.	
Blois	Europe	France	47 35 20 N.	1 20 1 E.	0 5 20 E.	
Boddam's Iſle	Aſia	Indian Ocean	5 22 0 S.	72 15 0 E.	4 49 0 E.	
Bojador (Cape)	Africa	Negroland	26 12 30 N.	14 27 0 W.	0 57 48 W.	0 0

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			° ′ ″	° ′ ″	H. M. S.	H. M.
Bolabola (Iſle)	America	Pacific Ocean	16 32 30 S.	151 52 0 W.	10 7 28 W.	
Bolcheretſk	Aſia	Kamtchatka	52 54 30 N.	156 56 40 E.	10 27 47 E.	
Bologna	Europe	Italy	44 29 36 N.	11 20 25 E.	0 45 22 E.	
Bolt Head	Europe	England	50 17 0 N.	3 53 30 W.	0 15 34 W.	
Bombay	Aſia	India	18 55 42 N.	72 54 24 E.	4 51 38 E.	
Bombay (Light-houſe)	Aſia	India	18 53 0 N.	72 52 54 E.	4 51 32 E.	
Bonaviſta (Iſle)	Africa	Cape Verd	16 3 40 N.	22 45 32 W.	1 31 2 W.	
Bonaheleon	Europe	Netherlands	50 48 17 N.	5 20 18 E.	0 21 21 E.	
Boſcawen's Iſle	Aſia	Pacific Ocean	15 50 0 S.	174 7 40 W.	11 36 31 W.	
Boſton	America	New England	42 25 0 N.	70 37 15 W.	4 42 29 W.	11 25
Botany (Iſland)	Aſia	New Caledonia	22 26 40 S.	167 16 45 E.	11 9 7 E.	
Botany Bay	Aſia	New Holland	34 6 0 S.	151 15 0 E.	10 5 0 E.	8 0
Boulogne	Europe	France	50 43 33 N.	1 36 33 E.	0 6 26 E.	11 0
Bourbon (Iſle)	Africa	Indian Ocean	20 50 54 S.	55 30 0 E.	3 42 0 E.	
Bourdeaux	Europe	France	44 50 14 N.	0 34 15 W.	0 2 17 W.	3 0
Bourgas	Aſia	Turkey	40 14 30 N.	26 26 52 E.	1 45 47 E.	
Bourges	Europe	France	47 4 59 N.	2 23 45 E.	0 9 35 E.	
Bow Iſland	America	Pacific Ocean	18 17 0 S.	140 43 0 W.	9 22 52 W.	
Brandenburg	Europe	Germany	52 27 0 N.	12 53 0 E.	0 51 32 E.	
Braſſe (Pulo)	Aſia	Straits of Malacca	- - -	95 11 0 E.	6 20 44 E.	
Brava (Iſle)	Africa	Cape Verd	14 50 58 N.	24 43 4 W.	1 38 52 W.	
Breaker's Point	America	Pacific Ocean	49 15 30 N.	126 41 30 W.	8 26 46 W.	
Breda	Europe	Holland	51 35 29 N.	4 46 9 E.	0 19 5 E.	
Bremen	Europe	Germany	53 5 11 N.	8 49 34 E.	0 35 18 E.	6 00
Breſlaw	Europe	Sileſia	51 6 30 N.	17 35 30 E.	1 10 22 E.	
Breſt	Europe	France	48 22 42 N.	4 30 0 W.	0 18 0 W.	3 15
Bridge Town	America	Barbadoes	13 5 0 N.	59 41 15 W.	3 58 45 W.	
St. Brieux	Europe	France	48 31 2 N.	2 44 10 W.	0 10 57 W.	
Brighthelmſtone	Europe	England	50 49 32 N.	0 11 55 W.	0 0 48 W.	10 00
Briſtol	Europe	England	51 28 0 N.	2 34 45 W.	0 10 19 W.	7 00
Briſtol (Cape)	America	Sandwich Land	59 2 30 S.	26 51 0 W.	1 47 24 W.	
Briſtol River	America	Beering's Straits	58 27 0 N.	158 7 30 W.	10 32 30 W.	
Broach Point	Aſia	India	21 38 30 N.	72 43 24 E.	4 50 54 E.	
Brothers (The)	Aſia	Sea of Borneo	5 10 20 S.	106 14 4 E.	7 4 56 E.	
Bruges	Europe	Netherlands	51 12 20 N.	3 13 13 E.	0 12 53 E.	
Brunn	Europe	Moravia	49 11 28 N.	16 35 6 E.	1 6 20 E.	
Bruſſels	Europe	Brabant	50 51 0 N.	4 21 15 E.	0 17 25 E.	
Buda	Europe	Hungary	47 29 44 N.	19 0 0 E.	1 16 0 E.	
Buenos Ayres	America	Braſil	34 35 26 S.	58 23 38 W.	3 53 35 W.	
Bukaroſt	Europe	Wallachia	44 26 45 N.	26 8 0 E.	1 44 32 E.	
Buller (Cape)	America	South Georgia	53 58 30 S.	37 40 0 W.	2 30 40 W.	
Burgeo (Iſles)	America	Newfoundland	47 36 20 N.	57 36 0 W.	3 50 24 W.	
Burhanpour	Aſia	India	21 19 0 N.	76 22 0 E.	5 5 28 E.	
Byron's Iſle	Aſia	Pacific Ocean	1 13 0 S.	177 8 0 E.	11 48 32 E.	
Cabello (Port)	America	Terra Firma	10 30 50 N.	67 32 0 W.	4 30 8 W.	
Cape Cabron	America	Hiſpaniola	19 21 52 N.	69 18 40 W.	4 37 15 W.	
Cadiz	Europe	Spain	36 31 7 N.	6 17 15 W.	0 25 9 W.	2 30
Caen	Europe	France	49 11 12 N.	0 21 53 W.	0 1 28 W.	9 0
Cahors	Europe	France	44 26 49 N.	1 26 22 E.	0 5 45 E.	

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Cajaneburg	Europe	Finland	64 13 30 N.	27 45 0 E.	1 51 0 E.	
Cairo	Africa	Egypt	30 3 30 N.	31 25 30 E.	2 5 42 E.	
Calais	Europe	France	50 57 32 N.	1 51 0 E.	0 7 24 E.	11 30
Calcutta (F. Will.)	Aſia	Bengal	22 34 45 N.	88 27 56 E.	5 53 52 E.	3 5
Callao	America	Peru	12 1 53 S.	76 58 0 W.	5 7 52 W.	
Calmar	Europe	Sweden	56 40 30 N.	16 25 15 E.	1 5 41 E.	
Calpy	Aſia	India	26 7 15 N.	80 0 0 E.	5 20 0 E.	
Calymere Point	Aſia	India	10 20 0 N.	79 46 0 E.	5 19 4 E.	
Cambray	Europe	France	50 10 37 N.	3 13 32 E.	0 12 54 E.	
Cambridge	Europe	England	52 12 36 N.	0 4 15 E.	0 0 17 E.	
Cambridge	America	New England	42 25 0 N.	71 6 0 W.	4 44 24 W.	
Camiſchin	Europe	Ruſſia	50 5 6 N.	45 24 0 E.	3 1 36 E.	
Campbell (Cape)	Aſia	New Zealand	41 40 48 S.	174 33 0 E.	11 38 12 E.	
Cananore (Point)	Aſia	India	11 51 0 N.	75 25 00 E.	5 1 40 E.	
Canary (Iſle) N.E.Pt.	Africa	Atlantic Ocean	28 13 0 N.	15 38 45 W.	1 2 35 W.	3 0
Candia (Iſle)	Europe	Mediterranean Sea	35 18 35 N.	25 18 0 E.	1 41 12 E.	
Candlemas Iſles	America	Sandwich Land	57 10 0 S.	27 13 0 W.	1 48 52 W.	
Canſo (Port)	America	Nova Scotia	45 20 7 N.	60 55 0 W.	4 3 40 W.	
Canterbury	Europe	England	51 18 26 N.	1 4 53 E.	0 4 20 E.	
Canton	Aſia	China	23 6 57 N.	113 16 7 E.	7 33 4 E.	
Capricorn (Cape)	Aſia	New Holland	23 26 40 S.	151 5 40 E.	10 4 23 E.	
Carcaſſone	Europe	France	43 12 45 N.	2 20 49 E.	0 9 23 E.	
Carleſcroon	Europe	Sweden	56 20 0 N.	15 30 0 E.	1 2 0 E.	
Cariſbrook Caſtle	Europe	Iſle of Wight	50 41 18 N.	1 18 26 W.	0 5 14 W.	
Carpentras	Europe	France	44 3 8 N.	5 2 35 E.	0 20 10 E.	
Carrickfergus	Europe	Ireland	54 43 0 N.	5 45 30 W.	0 23 2 W.	
Carthagena	Europe	Spain	37 36 7 N.	1 1 30 W.	0 4 6 W.	
Carthagena	America	Terra Firma	10 26 19 N.	75 20 35 W.	5 1 22 W.	
Carwar Head	Aſia	India	14 47 0 N.	74 12 30 E.	4 56 50 E.	
Caſan	Aſia	Siberia	55 43 58 N.	49 29 30 E.	3 17 58 E.	
Caſbine	Aſia	Perſia	36 11 0 N.	49 33 0 E.	3 18 12 E.	
Caſſel (Heſſe)	Europe	Germany	51 19 20 N.	9 31 45 E.	0 38 7 E.	
Caſtres	Europe	France	43 36 11 N.	2 14 16 E.	0 8 57 E.	
St. Catherine's Iſle	America	Braſil	27 32 30 S.	49 15 37 W.	3 17 2 W.	
St. Catharine's Lights	Europe	Iſle of Wight	50 35 33 N.	1 17 51 W.	0 5 11 W.	
Cavaillon	Europe	France	43 50 6 N.	5 1 55 E.	0 20 8 E.	
Cavan	Europe	Ireland	54 51 41 N.	7 25 20 W.	0 29 41 W.	
Cayenne	America	Iſle Cayenne	4 56 15 N.	52 15 0 W.	3 29 0 W.	
Cervia	Europe	Italy	44 15 31 N.	12 19 28 E.	0 49 18 E.	
Cette (Lights)	Europe	France	43 23 42 N.	3 41 46 E.	0 14 47 E.	
Chain Iſland	America	Pacific Ocean	17 25 30 S.	145 30 0 W.	9 42 0 W.	
Chalon ſur Saone	Europe	France	46 46 54 N.	4 51 2 E.	0 19 24 E.	
Chalons ſur Marne	Europe	France	48 57 28 N.	4 20 15 E.	0 17 21 E.	
Chandernagor	Aſia	Bengal	22 51 26 N.	88 29 15 E.	5 53 57 E.	
Charkow	Europe	Ruſſia	49 59 20 N.	36 15 0 E.	2 25 0 E.	
Charles (Cape)	America	Hudſon's Straits	62 46 30 N.	74 15 0 W.	4 57 0 W.	10 0
Q. Charlotte's Cape	America	South Georgia	54 32 0 S.	36 11 30 W.	2 24 46 W.	
Q. Charl. Foreland	Aſia	New Caledonia	22 15 0 S.	167 12 45 E.	11 8 51 E.	
Q. Charlotte's Iſle	America	Pacific Ocean	19 18 0 S.	138 20 0 W.	9 13 20 W.	
Q. Charlotte's Sound	Aſia	New Zealand	41 5 57 S.	174 20 50 E.	11 37 33 E.	9 0

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Charlotte Town	America	St. John's Iſland	46 14 0 N.	62 50 0 W.	4 11 20 W.	
Charlton Iſland	America	Hudſon's Bay	52 3 0 N.	79 5 0 W.	5 16 20 W.	
Chartres	Europe	France	48 26 54 N.	1 29 5 E.	0 5 56 E.	
Cherbourg	Europe	France	49 38 31 N.	1 37 18 W.	0 6 29 W.	7 30
Cherſon	Europe	Crimea	46 38 29 N.	32 56 15 E.	2 11 45 E.	
Chicheſter	Europe	England	50 50 11 N.	0 46 36 W.	0 3 6 W.	
Chilbambrum Pagoda	Aſia	India	11 24 42 N.	79 48 6 E.	5 19 12 E.	
Chiſlehurſt	Europe	England	51 24 33 N.	0 4 39 E.	0 0 19 E.	
Choule (Fort)	Aſia	India	18 32 0 N.	72 59 54 E.	4 52 0 E.	
Chriſtchurch	Europe	England	50 43 47 N.	1 46 3 W.	0 7 4 W.	
Chriſtiana	Europe	Norway	59 55 20 N.	10 48 45 E.	0 43 15 E.	
Chriſtiansfelt	Europe	Denmark	55 21 27 N.	9 29 46 E.	0 37 59 E.	
Chriſtmas Harbour	Africa	Kerguelen's Land	48 41 15 S.	69 2 0 E.	4 36 8 E.	10 0
Chriſtmas Iſle	America	Pacific Ocean	1 57 45 N.	157 35 0 W.	10 30 20 W.	
Chriſtmas Sound	America	Terra del Fuego	55 21 57 S.	70 2 50 W.	4 40 11 W.	2 30
St. Chriſtopher's Iſle	America	Caribbean Sea	17 15 0 N.	62 42 20 W.	4 10 49 W.	
Churchill River	America	Hudſon's Bay	58 47 32 N.	94 13 48 W.	6 16 55 W.	7 20
Civita Vecchia	Europe	Italy	42 5 24 N.	11 46 15 E.	0 47 5 E.	
Clapham (Obſervatory)	Europe	England	51 27 13 N.	0 8 39 W.	0 0 35 W.	
St. Claude	Europe	France	46 23 18 N.	5 51 50 E.	0 23 27 E.	
Clear (Cape)	Europe	Ireland	51 19 0 N.	9 23 15 W.	0 37 33 W.	4 30
Clerke's Iſle	Aſia	Beering's Straits	63 15 0 N.	169 40 0 W.	11 18 40 W.	
Clerke's Rocks	America	Atlantic Ocean	55 5 30 S.	34 42 0 W.	2 18 48 W.	
Clermont	Europe	France	45 46 44 N.	3 5 2 E.	0 12 20 E.	
Cochin	Aſia	Malabar	9 58 0 N.	76 15 34 E.	5 5 2 E.	
Cocos Iſles Great	Aſia	Bay of Bengal	14 5 0 N.	93 14 0 E.	6 12 56 E.	
Little	Aſia	Bay of Bengal	13 58 0 N.	93 7 0 E.	6 12 28 E.	
Coimbra	Europe	Portugal	40 14 0 N.	8 24 0 W.	0 33 36 W.	
Colenet (Cape)	Aſia	New Caledonia	20 30 0 S.	164 56 0 E.	10 59 44 E.	
Collioure	Europe	France	42 31 31 N.	3 3 2 E.	0 12 20 E.	
Colmar	Europe	France	48 4 44 N.	7 22 11 E.	0 29 29 E.	
Cologne	Europe	Germany	50 55 21 N.	6 55 0 E.	0 27 40 E.	
Colville (Cape)	Aſia	New Zeeland	36 24 45 S.	175 48 50 E.	11 43 15 E.	
Comerin (Cape)	Aſia	India	8 4 0 N.	77 33 50 E.	5 10 15 E.	
Commachio	Europe	Italy	44 40 27 N.	12 9 47 E.	0 48 39 E.	
Compiegne	Europe	France	49 24 59 N.	2 49 41 E.	0 11 19 E.	
Conception	America	Chili	36 42 54 S.	73 6 18 W.	4 52 25 W.	
Condom	Europe	France	43 57 49 N.	0 22 7 E.	0 1 28 E.	
Condore (Pulo)	Aſia	Chineſe Sea	8 40 48 N.	106 42 54 E.	7 6 52 E.	4 16
Condre Iſle (N. W. ſi.)	America	Canada	47 15 33 N.	70 18 57 W	4 41 16 W.	
Conſtantinople	Europe	Turkey	41 1 10 N.	28 55 5 E.	1 55 40 E.	
Cook's Town	Europe	Ireland	54 38 20 N.	6 40 0 W.	0 26 40 W.	
Cooper's Iſle	America	Atlantic Ocean	54 57 0 S.	36 4 20 W.	2 24 17 W.	
Copenhagen	Europe	Denmark	55 41 4 N.	12 35 10 E.	0 50 21 E.	
Coquimbo	America	Chili	29 54 33 S.	71 15 45 W.	4 45 3 W.	
Cordouan (Lights)	Europe	France	45 35 14 N.	1 10 10 W.	0 4 41 W.	
Cork	Europe	Ireland	51 53 54 N.	8 28 15 W.	0 33 53 W.	6 30
Corneto	Europe	Italy	42 15 23 N.	11 43 0 E.	0 46 52 E.	
Cornwallis (Port)	Aſia	Andaman	13 20 30 N.	92 51 0 E.	6 11 24 E.	10 0
Cornwallis (Fort)	Aſia	Port Pinnang	5 27 0 N.	100 26 30 E.	6 41 46 E.	

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Coronation (Cape)	Aſia	New Caledonia	22 5 0 S.	167 8 0 W.	11 8 32 E.	
Corvo	Europe	Azores	39 43 38 N.	31 4 56 W.	2 4 20 W.	
Coul'aba Iſland	Aſia	Indian Ocean	18 37 20 N.	72 56 30 E.	4 51 46 E.	
Coutances	Europe	France	49 2 54 N.	1 26 35 W.	0 5 46 W.	
Courtray	Europe	Netherlands	50 49 43 N.	3 15 51 E.	0 13 3 E.	
Cowes (Weſt)	Europe	Iſle of Wight	50 46 18 N.	1 17 17 W.	0 5 9 W.	10 30
Cracatoa (Iſle)	Aſia	Straits of Sunda	6 6 0 S.	105 31 40 E.	7 2 7 E.	
Cracow	Europe	Poland	50 10 0 N.	19 50 0 E.	1 19 20 E.	
Cremona	Europe	Italy	45 7 49 N.	10 6 22 E.	0 40 25 E.	
Creſmunſter	Europe	Germany	48 3 30 N.	14 7 21 E.	0 56 29 E.	
Croiſic	Europe	France	47 17 40 N.	2 31 42 W.	0 10 7 W.	
Crooked Iſle	America	Lucayes	22 48 50 N.	74 26 5 W.	4 57 44 W.	
Croque Harbour	America	Newfoundland	51 3 17 N.	55 50 0 W.	3 43 20 W.	
Croſs Cape	America	Pacific Ocean	57 58 30 N.	136 44 30 W.	9 6 58 W.	
Cuddalore	Aſia	India	11 41 0 N.	79 37 45 E.	5 18 31 E.	
Cumberland (Cape)	Aſia	New Hebrides	14 39 30 S.	166 47 0 E.	11 7 8 E.	
Cumberland Houſe	America	New Wales	53 56 40 N.	102 9 0 W.	6 48 36 W.	
Cumberland Iſle	America	Pacific Ocean	19 18 0 S.	140 52 0 W.	9 23 28 W.	
Cummin (Iſle)	Aſia	Chineſe Sea	31 40 0 N.	121 4 0 E.	8 4 16 E.	
Curreuſe Iſle	Aſia	Almirantes	4 19 0 S.	55 47 0 E.	3 43 8 E.	5 10
Dagger-Ort	Europe	Baltic	58 56 1 N.	22 9 0 E.	1 28 36 E.	
Damoan Fort	Aſia	India	20 22 0 N.	73 2 45 E.	4 52 11 E.	
Danger (Point)	Aſia	New Holland	28 8 22 S.	153 33 10 E.	10 14 13 E.	
Danger (Iſles of)	Aſia	Pacific Ocean	10 56 0 S.	165 59 0 W.	11 3 56 W.	
Dantzic	Europe	Poland	54 22 0 N.	18 40 0 E.	1 14 40 E.	
Darby (Cape)	America	Beering's Straits	64 21 0 N.	163 0 0 W.	10 52 0 W.	
Daſſen Iſland	Africa	Caffers	33 25 0 S.	18 1 52 E.	1 12 7 E.	
Dax	Europe	France	43 42 19 N.	1 3 16 W.	0 4 13 W.	
Deal Caſtle	Europe	England	51 13 5 N.	1 23 59 E.	0 5 36 E.	11 15
Delhi	Aſia	India	28 37 0 N.	77 40 0 E.	5 10 40 E.	
Dengeneſs or Dungeneſs	Europe	England	50 54 52 N.	0 57 40 E.	0 3 51 E.	11 15
Dennis (St.)	Africa	Iſle of Bourbon	20 51 43 S.	55 30 0 E.	3 42 0 E.	
Dereham (Eaſt)	Europe	England	52 40 20 N.	0 54 30 E.	0 3 38 E.	
Devi-cotta	Aſia	India	11 21 0 N.	79 47 0 E.	5 19 8 E.	
Diamond Iſland	Aſia	Bay of Bengal	15 50 0 N.	94 17 54 E.	6 17 12 E.	
Diarbekir	Aſia	Diarbek	37 54 0 N.	39 20 0 E.	2 37 20 E.	
Die	Europe	France	44 45 31 N.	5 22 18 E.	0 21 29 E.	
Diego (Cape)	America	Terra del Fuego	54 33 0 S.	65 14 0 W.	4 20 56 W.	
Diego Garcia	Aſia	Indian Ocean	7 20 0 S.	72 24 52 E.	4 49 39 E.	
Diego Ramirez	America	Southern Ocean	56 32 30 S.	67 55 0 W.	4 31 40 W.	
Dieppe	Europe	France	49 55 34 N.	1 4 29 E.	0 4 18 E.	11 15
Digby (Cape)	Aſia	Kerguelen's Land	49 23 30 S.	70 32 0 E.	4 42 8 E.	
Digges (Iſle)	America	Hudſon's Bay	62 41 0 N.	78 50 0 W.	5 15 20 W.	
Digne	Europe	France	44 5 18 N.	6 14 4 E.	0 24 56 E.	
Dijon	Europe	France	47 19 25 N.	5 1 48 E.	0 20 7 E.	
Dilla (Mount)	Aſia	Malabar Coaſt	11 59 40 N.	75 14 30 E.	5 0 58 E.	
Dillingen	Europe	Germany	48 34 10 N.	10 29 12 E.	0 41 57 E.	
Diſappointment (Cape)	America	South Georgia	54 58 0 S.	36 15 0 W.	2 25 0 W.	
Diſappointment (Iſle)	America	Pacific Ocean	14 7 0 S.	141 22 0 W.	9 25 28 W.	

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Diſeada (Cape)	America	Terra del Fuego	53 4 15 S.	74 18 0 W.	4 57 12 W.	
Diſerada	America	Caribbee Iſles	16 35 0 N.	61 11 15 W.	4 4 45 W.	
Diu Head	Aſia	Guzerat	20 42 0 N.	71 3 30 E.	4 44 14 E.	
Dix Cove Fort	Africa	Gold Coaſt	4 44 0 N.	2 37 44 W.	0 10 31 W.	
Dixmude	Europe	Netherlands	51 2 5 N.	2 51 39 E.	0 11 27 E.	
Dol	Europe	France	48 33 8 N.	1 45 28 W.	0 7 2 W.	
Domar (Pulo)	Aſia	Chineſe Sea	2 47 0 N.	105 21 0 E.	7 1 24 E.	
Dominique (Iſle)	America	Windward Iſles	15 18 23 N.	61 35 30 W.	4 6 22 W.	
Donna Maria (Cape)	America	Hiſpaniola	18 37 20 N.	74 35 52 W.	4 58 23 W.	
Dorcheſter	Europe	England	50 42 58 N.	2 25 40 W.	0 9 43 W.	
Douay	Europe	Flanders	50 22 12 N.	3 4 47 E.	0 12 19 E.	
Dover	Europe	England	51 7 48 N.	1 19 2 E.	0 5 16 E.	11.15
Douglas (Cape)	America	Cook's River	58 56 0 N.	153 50 0 W.	10 15 20 W.	
Drake's Iſland	Europe	Plymouth Sound	50 21 30 N.	4 13 30 W.	0 16 54 W.	5 45
Dreſden	Europe	Saxony	51 2 54 N.	13 41 15 E.	0 54 45 E.	
Dreux	Europe	France	48 44 17 N.	1 21 24 E.	0 5 26 E.	
Drontheim	Europe	Norway	63 26 6 N.	10 22 0 E.	0 41 28 E.	2 15
Druja	Europe	Ruſſia	55 47 29 N.	27 13 30 E.	1 48 54 E.	
Dublin	Europe	Ireland	53 22 0 N.	6 17 0 W.	0 25 8 W.	9 45
Dublin Obſervatory	Europe	Ireland	53 23 7 N.	6 20 30 W.	0 25 22 W.	
Dundee	Europe	Scotland	56 25 0 N.	3 2 30 W.	0 12 10 W.	
Dundra-Head	Aſia	Ceylon	5 51 0 N.	80 41 20 E.	5 22 45 E.	
Dunkirk	Europe	France	51 2 9 N.	2 22 4 E.	0 9 28 E.	11 45
Duſky Bay	Aſia	New Zeeland	45 47 27 S.	166 18 9 E.	11 5 13 E.	10 57
Dun-Noſe	Europe	England	50 37 7 N.	1 11 36 W.	0 4 46 W.	9 45
Eagle Iſland	Aſia	Almirantes	5 10 0 S.	55 37 0 E.	3 42 28 E.	3 30
Eaoowe (Iſle)	Aſia	Pacific Ocean	21 24 0 S.	174 30 0 W.	11 38 0 W.	7 0
Eaſt Cape	Aſia	Beering's Straits	66 5 30 N.	169 44 0 W.	11 18 56 W.	
Eaſt Cape	Aſia	New Zeeland	37 44 25 S.	178 58 0 E.	11 55 52 E.	
Eaſt Main (Fort)	America	Labrador	52 15 0 N.	78 57 49 W.	5 15 51 W.	
Eaſter Iſland	America	Pacific Ocean	27 6 30 S.	109 46 45 W.	7 19 7 W.	2 0
Ecaterinburg	Aſia	Siberia	56 50 15 N.	60 50 0 E.	4 3 20 E.	
Edam (Iſle)	Aſia	Batavia Bay	5 57 30 S.	106 51 0 E.	7 7 24 E.	
Edgecumbe (Cape)	America	Pacific Ocean	57 4 30 N.	135 55 30 W.	9 3 42 W.	
Edinburg	Europe	Scotland	55 56 42 N.	3 12 15 W.	0 12 49 W.	4 30
Edward's (Pr.) Iſles	Africa	Ind. Ocean N.	46 39 30 S.	38 2 30 E.	2 32 10 E.	
		S.	46 52 30 S.	37 47 0 E.	2 31 8 E.	
Edyſtone	Europe	Engliſh Channel	50 8 0 N.	4 24 0 W.	0 17 36 W.	5 30
Egmont (Cape)	Aſia	New Zeeland	39 23 20 S.	174 12 30 E.	11 36 50 E.	
Egmont (Iſle)	America	Pacific Ocean	19 20 0 S.	138 46 0 W.	9 15 4 W.	
Eimeo (Iſle)	America	Pacific Ocean	17 30 0 S.	149 54 0 W.	9 59 36 W.	
Elephant Point	Aſia	Ceylon	6 20 0 N.	81 39 15 E.	5 26 37 E.	
Elias's (St.) Mount	America	Pacific Ocean	60 24 30 N.	141 0 0 W.	9 24 0 W.	
Elizabeth (Cape)	America	Pacific Ocean	59 11 0 N.	152 12 0 W.	10 8 48 W.	
Elmina Caſtle	Africa	Gold Coaſt	5 1 38 N.	2 0 12 W.	0 8 1 W.	
Eltham	Europe	England	51 27 4 N.	0 3 10 E.	0 0 13 E.	
Embrun	Europe	France	44 34 7 N.	6 25 54 E.	0 25 44 E.	
Enatum (Iſle)	Aſia	Pacific Ocean	20 10 0 S.	170 4 0 E.	11 20 16 E.	
Enckhuyſen	Europe	Holland	52 42 22 N.	5 10 0 E.	0 20 40 E.	

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Engliſh Road	Aſia	Eaoowee	21 20 30 S.	174 49 0 W.	11 39 16 W.	
Endeavour River	Aſia	New Holland	15 27 11 S.	145 10 0 E.	9 40 40 E.	
Enos	Europe	Turkey	40 41 58 N.	25 58 30 E.	1 43 54 E.	
Erramanga (Iſle)	Aſia	Pacific Ocean	18 46 30 S.	169 18 30 E.	11 17 14 E.	
Erzerum	Aſia	Turkey	39 56 35 N.	48 35 45 E.	3 14 23 E.	
Eſpiritu Santo	America	Cuba	21 57 41 N.	79 49 30 W.	5 19 18 W.	
Euſtachia (Town)	America	Caribbean Sea	17 29 0 N.	63 2 0 W.	4 12 8 W.	
Evout's Iſles	America	Terra del Fuego	55 34 30 S.	66 59 0 W.	4 27 56 W.	
Evreux	Europe	France	49 1 30 N.	1 8 54 E.	0 4 36 E.	
Exeter	Europe	England	50 44′ 0 N.	3 34 30 W.	0 14 18 W.	
Fairſight	Europe	England	50 52 39 N.	0 38 35 E.	0 2 34 E.	
Falmouth	Europe	England	50 8 0 N.	5 3 0 W.	0 20 12 W.	5 30
Falſe (Cape)	Africa	Caffres	34 16 0 S.	18 44 0 E.	1 14 56 E.	
Falſe Bay	Africa	Caffres	34 10 0 S.	18 33 0 E.	1 14 12 E.	
Fano	Europe	Italy	43 51 0 N.	12 59 38 E.	0 51 59 E.	
Fareham	Europe	England	50 51 20 N.	1 10 11 W.	0 4 41 W.	
Farewell (Cape)	America	Greenland	59 38 0 N.	42 42 0 W.	2 50 48 W.	
Farewell (Cape)	Aſia	New Zeeland	40 37 0 S.	172 49 38 E.	11 31 19 E.	
Farnham	Europe	England	51 13 7 N.	0 47 52 W.	0 3 11 W.	
Fayal (Town)	Europe	Azores	38 32 20 N.	28 41 5 W.	1 54 44 W.	
Fecamp	Europe	France	49 45 24 N.	0 22 48 E.	0 1 31 E.	
Felix and Amb. Iſles	America	Pacific Ocean	26 16 0 S.	79 16 0 W.	5 17 4 W.	
Ferdinand Noronha	America	Brazil	3 56 20 S.	32 38 0 W.	2 10 32 W.	
Fermo	Europe	Italy	43 10 18 N.	13 41 26 E.	0 54 46 E.	
Fernando Po	Africa	Atlantic Ocean	3 28 0 N.	8 40 0 E.	0 34 40 E.	
Ferrara	Europe	Italy	44 49 46 N.	11 36 15 E.	0 46 25 E.	
Ferraria (Point)	Europe	St. Michael (Az.)	37 49 41 N.	25 59 49 W.	1 43 59 W.	
Ferro (Town)	Africa	Canaries	27 47 35 N.	17 45 8 W.	1 11 1 W.	
Finiſterre (Cape)	Europe	Spain	42 53 30 N.	9 18 24 W.	0 37 14 W.	
Fizeron (Cape)	Europe	Portugal	39 19 0 N.	11 43 53 W.	0 46 56 W.	
Fladſtrand	Europe	Denmark	57 27 3 N.	10 33 15 E.	0 42 13 E.	
Flattery (Cape)	America	New Albion	48 15 30 N.	124 58 30 W.	8 19 54 W.	
Flenſburg	Europe	Denmark	54 47 8 N.	9 27 6 E.	0 37 48 E.	
Florence	Europe	Italy	43 46 30 N.	11 3 30 E.	0 44 14 E.	
Flores	Europe	Azores	39 26 20 N.	31 11 22 W.	2 4 45 W.	
Flour (Saint)	Europe	France	45 1 53 N.	3 5 24 E.	0 12 22 E.	
Fluſhing	Europe	Holland	51 26 37 N.	3 34 9 E.	0 14 17 E.	
Foggy Iſland	America	Pacific Ocean	56 12 0 N.	157 19 30 W.	10 29 18 W.	
Foktzáni	Europe	Turkey	45 38 51 N.	27 2 30 E.	1 48 10 E.	
Folkſtone	Europe	England	51 5 45 N.	1 11 29 W.	0 4 46 W.	
Fontarabia	Europe	Spain	43 21 36 N.	1 47 29 W.	0 7 10 W.	
S. Foreland (Light)	Europe	England	51 8 21 N.	1 22 6 E.	0 5 28 E.	
N. Foreland	Europe	England	51 22 40 N.	1 26 22 E.	0 5 45 E.	
Fortaventure (W. P.)	Africa	Canaries	28 4 0 N.	14 31 30 W.	0 58 6 W.	
Foul Point	Africa	Madagaſcar	17 40 14 S.	49 52 30 E.	3 19 30 E.	
Foulweather (Cape)	America	Pacific Ocean	44 53 0 N.	124 10 0 W.	8 16 40 W.	
Frampton Houſe	Europe	Wales	51 25 1 N.	3 29 30 W.	0 13 58 W.	
France (Iſle of)	Africa	Indian Ocean	20 9 43 S.	57 31 30 E.	3 50 6 E.	
Francfort (on the M.)	Europe	Germany	50 7 40 N.	8 35 45 E.	0 34 23 E.	

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Francfort (on the Od.)	Europe	Germany	52 22 8 N.	14 45 0 E.	0 59 3 E.	
Franciſco (St.)	America	New Albion	37 48 30 N.	122 7 20 W.	8 8 30 W.	11 15
Francois (Cape)	America	Hiſpaniola	19 46 40 N.	72 17 45 W.	4 49 11 W.	
Francois (Old Cape)	America	Hiſpaniola	19 40 30 N.	70 2 0 W.	4 40 8 W.	
Frant	Europe	England	51 5 54 N.	0 16 13 E.	0 1 5 E.	
Frawenburg	Europe	Pruſſia	54 22 15 N.	20 7 30 E.	1 20 30 E.	
Free Town	Africa	Sierra Leone	8 29 40 N.	13 5 17 W.	0 52 21 W.	
Frehel (Light)	Europe	France	48 41 10 N.	2 18 57 W.	0 9 15 W.	
Frejus	Europe	France	43 25 52 N.	6 43 54 E.	0 26 56 E.	
Frieſland's Peak	America	Sandwich Land	59 2 0 S.	26 55 30 W.	1 47 42 W.	
Frio (Cape)	America	Braſil	22 54 0 S.	42 8 15 W.	2 48 33 W.	
Frio (Cape)	Africa	Caffraria	18 40 0 S.	12 26 0 E.	0 49 44 E.	
Fronſac (Strait)	America	Nova Scotia	45 36 57 N.	61 19 30 W.	4 5 18 W.	
Fuego (Iſle)	Africa	Cape Verd	14 57 2 N.	24 22 2 W.	1 37 32 W.	
Fulham	Europe	England	51 28 7 N.	0 12 35 W.	0 0 50 W.	
Funchal	Africa	Madeira	32 37 20 N.	16 55 36 W.	1 7 42 W.	12 4
Furneaux (Iſland)	America	Pacific Ocean	17 11 0 S.	143 6 40 W.	9 32 27 W.	
Furneſs	Europe	Netherlands	51 4 23 N.	2 39 36 E.	0 10 38 E.	
Gabey	Aſia	New Guinea	0 6 0 S.	126 23 45 E.	8 25 35 E.	
Galle (Cape de)	Aſia	Ceylon	6 1 0 N.	80 19 20 E.	5 21 17 E.	
Gallipoli	Europe	Turkey	40 25 33 N.	26 37 15 E.	1 46 29 E.	
Gand	Europe	Netherlands	51 3 15 N.	3 43 20 E.	0 14 53 E.	
Ganjam	Aſia	India	19 22 30 N.	85 18 30 E.	5 41 14 E.	
Gap	Europe	France	44 33 37 N.	6 4 47 E.	0 24 19 E.	
Gaſpar (Iſland)	Aſia	Str. of Gaſper	2 25 0 S.	107 7 45 E.	7 8 31 E.	
Gaſpee	America	G. St. Lawrence	48 47 30 N.	64 27 30 W.	4 17 50 W.	
Gavarea (Cape)	Aſia	Kamtchatka	51 20 30 N.	158 36 0 E.	10 34 24 E.	
Geinhauſen	Europe	Germany	50 13 25 N.	9 13 38 E.	0 36 55 E.	
Geneva	Europe	Savoy	46 12 17 N.	6 8 24 E.	0 24 34 E.	
Genoa	Europe	Italy	44 25 0 N.	8 51 15 E.	0 35 25 E.	
St. George (Iſle)	Europe	Azores	38 53 30 N.	28 10 0 W.	1 52 40 W.	
St. George (Town)	America	Bermudas	32 22 20 N.	64 14 15 W.	4 16 57 W.	
St. George (Fort)	America	Hiſpaniola	18 18 40 N.	73 11 49 W.	4 52 47 W.	
St. George (Fort)	Aſia	India	13 4 54 N.	80 24 49 E.	5 21 39 E.	
St. George (Cape)	America	Newfoundland	48 30 5 N.	59 20 33 W.	3 57 22 W.	
St. George (Cape)	Aſia	New Holland	35 10 30 S.	150 29 0 E.	10 1 56 E.	
St. George (Cape)	Aſia	New Britain	4 53 30 S.	153 8 45 E.	10 12 35 E.	
George (Cape)	America	South Georgia	54 17 0 S.	36 32 30 W.	2 26 10 W.	
George (Cape)	Aſia	Kerguelen's Land	49 54 30 S.	70 12 0 E.	4 40 48 E.	
Geriah	Aſia	Malabar	16 37 0 N.	73 22 24 E.	4 53 30 E.	
Ghent	Europe	Flanders	51 3 15 N.	3 43 20 E.	0 14 53 E.	
Gibraltar	Europe	Spain	36 4 44 N.	5 4 0 W.	0 20 16 W.	0 0
Gilbert's Iſle	America	Terra del Fuego	55 13 0 S.	71 6 45 W.	4 44 27 W.	
Glandeve	Europe	France	43 56 43 N.	6 48 10 E.	0 27 13 E.	
Glaſgow	Europe	Scotland	55 51 32 N.	4 16 0 W.	0 17 4 W.	
Gloceſter Houſe	America	New Wales	51 24 26 N.	87 26 2 W.	5 49 44 W.	
Gloceſter Iſle	America	Pacific Ocean	19 11 0 S.	140 20 0 W.	9 21 20 W.	
Gluchow	Europe	Ruſſia	51 40 30 N.	34 20 0 E.	2 17 20 E.	
Gluckſtad	Europe	Holſtein	53 47 44 N.	9 27 0 E.	0 37 48 E.	

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Goa	Aſia	India	15 28 20 N.	73 58 39 E.	4 55 55 E.	
Goat Iſle	Aſia	Chineſe Sea	13 55 0 N.	120 2 0 E.	8 0 8 E.	
Goave (La Petit)	America	Hiſpaniola	18 27 0 N.	72 45 34 W.	4 51 2 W.	
Goes	Europe	Zeeland	51 30 18 N.	3 53 5 E.	0 15 32 E.	
Gogo	Aſia	India	21 40 30 N.	72 21 15 E.	4 49 25 E.	
Gomera (Iſle)	Africa	Canaries	28 5 40 N.	17 8 0 W.	1 8 32 W.	
Gonave (Iſle N.E. Pt.)	America	Hiſpaniola	18 48 35 N.	72 56 27 W.	4 51 46 W.	
Good Hope (Cape)	Africa	Caffraria	34 29 0 S.	18 23 15 E.	1 13 33 E.	3 0
Good Hope (Town)	Africa	Caffraria	33 55 42 S.	18 23 7 E.	1 13 32 E.	2 30
Goodwood	Europe	England	50 52 21 N.	0 44 9 W.	0 2 57 W.	
Goree (Iſle)	Africa	Atlantic Ocean	14 40 5 N.	17 24 30 W.	1 9 38 W.	1 30
Gotha	Europe	Germany	50 56 17 N.	10 41 46 E.	0 42 46 E.	
Gothaah	America	Greenland	64 9 55 N.	51 46 45 W.	3 27 7 W.	
Gottenburg	Europe	Sweden	57 42 0 N.	11 57 30 E.	0 47 50 E.	
Gottingen (Obſer.)	Europe	Germany	51 31 54 N.	9 54 15 E.	0 39 37 E.	
Goudhurſt	Europe	England	51 6 50 N.	0 27 39 E.	0 1 51 E.	
Grafton (Iſle)	Aſia	Baſhees	21 4 0 N.	120 55 11 E.	8 3 41 E.	
Grafton (Cape)	Aſia	New Holland	16 53 30 S.	145 42 45 E.	9 42 51 E.	
Granada (Fort Royal)	America	Caribbean Sea	12 2 54 N.	61 51 15 W.	4 7 25 W.	
Granville	Europe	France	48 50 16 N.	1 36 15 W.	0 6 25 W.	6 45
Graſſe	Europe	France	43 39 19 N.	6 55 9 E.	0 27 41 E.	
Gratioſa	Europe	Azores	39 11 0 N.	27 54 30 W.	1 51 38 W.	
Gratz	Europe	Germany	47 4 9 N.	15 25 45 E.	1 1 43 E.	0 0
Gravelines	Europe	Flanders	50 59 10 N.	2 7 35 E.	0 8 30 E.	
Gravois (Point)	America	Hiſpaniola	18 0 55 N.	74 2 15 W.	4 56 9 W.	
Greenwich (Obſer.)	Europe	England	51 28 40 N.	0 0 0	0 0 0	
Grenaae	Europe	Denmark	56 24 57 N.	10 53 21 E.	0 43 33 E.	
Gregory (Cape)	America	Pacific Ocean	43 29 0 N.	124 9 0 W.	8 16 36 W.	
Grenoble	Europe	France	45 11 42 N.	5 43 34 E.	0 22 54 E.	
Grenville (Cape)	America	Pacific Ocean	57 31 0 N.	152 37 30 W.	10 10 30 W.	
Grouais (Iſle)	Europe	France	47 38 4 N.	3 26 23 W.	0 13 46 W.	
Grinſted (Eaſt)	Europe	England	51 7 28 N.	0 0 16 E.	0 0 1 E.	
Grinſted (Weſt)	Europe	England	50 58 24 N.	0 19 53 W.	0 1 20 W.	
Gryphiſwald	Europe	Germany	54 5 15 N.	13 35 15 E.	0 54 5 E.	
Guadaloupe	America	Caribbean Sea	15 59 30 N.	61 48 15 W.	4 7 15 W.	
Guiaquil	America	Peru	2 11 18 S.	79 20 52 W.	5 17 23 W.	
Gurief	Aſia	Siberia	47 7 7 N.	51 59 15 E.	3 27 57 E.	
Haderſleben	Europe	Denmark	55 15 6 N.	9 30 15 E.	0 38 1 E.	
Hague	Europe	Holland	52 4 12 N.	4 16 2 E.	0 17 4 E.	8 15
Halifax	America	Nova Scotia	44 44 0 N.	63 36 0 W.	4 14 24 W.	7 30
Hamburg	Europe	Germany	53 33 3 N.	9 55 15 E.	0 39 41 E.	6 0
Hammerfoſt (Iſle)	Europe	North Sea	70 38 43 N.	23 43 35 E.	1 34 54 E.	
Hampſtead	Europe	England	51 33 19 N.	0 10 42 W.	0 0 43 W.	
Hang-lip (Cape)	Africa	Caffraria	34 16 0 S.	18 44 0 E.	1 14 56 E.	
Hanover	Europe	Germany	52 22 18 N.	9 44 15 E.	0 38 57 E.	
Harbro' (Market)	Europe	England	52 28 30 N.	0 57 25 W.	0 3 50 W.	
Harefield	Europe	England	51 36 10 N.	0 29 15 W.	0 1 57 W.	
Harlem	Europe	Holland	52 22 14 N.	4 37 0 E.	0 18 28 E.	
Harrow on the Hill	Europe	England	51 34 27 N.	0 20 3 W.	0 1 20 W.	

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Haſtings	Europe	England	50 52 10 N.	0 41 10 E.	0 2 45 E.	11 0
Havannah	America	Cuba	23 11 52 N.	82 8 36 W.	5 28 34 W.	
Havant	Europe	England	50 51 5 N.	0 58 38 W.	0 3 55 W.	
Havre-de-Grace	Europe	France	49 29 14 N.	0 6 23 E.	0 0 26 E.	9 0
Hawkhill	Europe	Scotland	55 57 37 N.	3 10 15 W.	0 12 41 W.	
Heeſe (La)	Europe	Netherlands	51 23 2 N.	4 44 45 E.	0 18 59 E.	
St. Helena (Ja.To.)	Africa	S. Atlantic Ocean	15 55 0 S.	5 43 30 W.	0 22 54 W.	2 15
Hengiſtbury Head	Europe	England	50 42 57 N.	1 45 11 W.	0 7 1 W.	
Henley Houſe	America	New Wales	51 14 28 N.	84 46 15 W.	5 39 5 W.	
Henlopen (Cape)	America	Virginia	38 47 8 N.	75 12 31 W.	5 0 50 W.	9 0
Henry (Cape)	America	Virginia	36 57 0 N.	76 31 30 W.	5 6 6 W.	
Heraclia	Europe	Turkey	41 1 3 N.	27 54 19 E.	1 51 37 E.	
St. Hermogenes (Iſle)	America	Cook's River	58 15 0 N.	152 13 0 W.	10 8 52 W.	
Hernoſand	Europe	Sweden	62 38 0 N.	17 50 15 E.	1 11 21 E.	
Hervey's (Iſle)	America	Pacific Ocean	19 17 0 S.	158 56 20 W.	10 35 45 W.	
Heſſeloe (Iſle)	Europe	Categat	56 11 46 N.	11 43 45 E.	0 46 55 E.	
Heve (Cape la)	Europe	France	49 30 42 N.	0 4 0 E.	0 0 16 E.	
Highbury Houſe	Europe	England	51 33 13 N.	0 5 51 W.	0 0 23 W.	
Highclere	Europe	England	51 18 46 N.	1 20 16 W.	0 5 21 W.	
Highgate	Europe	England	51 34 16 N.	0 8 50 W.	0 0 35 W.	
Hinchinbroke (Iſle)	Aſia	Pacific Ocean	17 25 0 S.	168 38 0 E.	11 14 32 E.	
Hinchinbroke (Cape)	America	Pr. Wm's Sound	60 16 0 N.	146 55 0 W.	9 47 40 W.	
Hiorin	Europe	Denmark	57 27 44 N.	9 59 58 E.	0 40 0 E.	
Hoai-Nghan	Aſia	China	33 34 40 N.	118 49 30 E.	7 55 18 E.	
Hogue (Cape la)	Europe	France	49 44 40 N.	1 56 50 W.	0 7 47 W.	0 0
Hola	Europe	Iceland	65 44 0 N.	19 44 0 W.	1 18 56 W.	
Holme Point	Europe	England	52 59 40 N.	0 30 45 E.	0 2 3 E.	
Honfleur	Europe	France	49 25 13 N.	0 13 59 E.	0 0 56 E.	9 0
Hood's Iſle	America	Pacific Ocean	9 26 0 S.	138 52 0 W.	9 15 28 W.	
Hoogſtraeten	Europe	Netherlands	51 24 44 N.	4 46 15 E.	0 19 5 E.	
Horn (Cape)	America	Terra del Fuego	55 58 30 S.	67 26 0 W.	4 29 44 W.	
Horndean	Europe	England	50 55 33 N.	1 0 21 W.	0 4 1 W.	
Horſham	Europe	England	51 3 36 N.	0 19 43 W.	0 1 19 W.	
Hout Bay	Africa	Caffraria	34 3 0 S.	18 19 0 E.	1 13 16 E.	
Howe's Iſle	America	Pacific Ocean	16 46 30 S.	154 6 40 W.	10 16 27 W.	
Howe (Cape)	Aſia	New Holland	37 31 15 S.	145 31 0 E.	9 58 4 E.	
Huahine (Iſle)	America	Pacific Ocean	16 44 0 S.	151 6 0 W.	10 4 24 W.	
Hueen (Iſle)	Europe	Sound	55 54 38 N.	12 41 30 E.	0 50 46 E.	
Hudſon's Houſe	America	New Wales	53 0 32 N.	106 27 48 W.	7 5 51 W.	
Hunaſton Lights	Europe	England	52 58 40 N.	0 28 0 E.	0 1 52 E.	
Hurſt Lighthouſe	Europe	England	50 42 23 N.	1 32 50 W.	0 6 11 W.	
Hurſtmonceux	Europe	England	50 51 35 N.	0 19 42 E.	0 1 19 E.	
Huſum	Europe	Denmark	54 28 48 N.	9 4 7 E.	0 36 16 E.	
Hydrabad	Aſia	Golconda	17 12 4 N.	78 51 0 E.	5 15 24 E.	
Jackſon (Port)	Aſia	New Holland	33 51 7 S.	141 13 30 E.	10 4 54 E.	
Jaffrabad (Fort)	Aſia	India	20 52 50 N.	71 36 30 E.	4 46 26 E.	
Jakutſk	Aſia	Siberia	62 1 52 N.	129 43 30 E.	8 38 55 E.	
Jakutſkoi-Noſs	Aſia	Kamtchatka	66 5 30 N.	169 44 0 W.	11 18 56 W.	
Janeiro (Rio)	America	Braſil	22 54 10 S.	43 10 45 W.	2 52 43 W.	2 5

TABLE of the Latitudes and Longitudes of Places.

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			° ′ ″	° ′ ″	H. M. S.	H. M.
Jaroſlawl	Europe	Ruſſia	57 37 30 N.	40 10 0 E.	2 40 40 E.	
Jarra (Pulo)	Aſia	Str. of Malacca	3 57 0 N.	100 17 0 E.	6 41 8 E.	
Jaſſey	Europe	Moldavia	47 8 32 N.	27 29 45 E.	1 49 59 E.	
Java Head	Aſia	Java	6 48 30 S.	105 7 25 E.	7 0 30 E.	
Icy Cape	America	Beering's Straits	70 29 0 N.	161 42 30 W.	10 46 50 W.	
Idolhos (Iſles)	Africa	Atlantic Ocean	9 27 0 N.	13 32 30 W.	0 54 10 W.	
Jenikola	Europe	Crimea	45 21 0 N.	36 26 30 E.	2 25 46 E.	
Jeniſeik	Aſia	Siberia	58 27 17 N.	91 58 30 E.	6 7 54 E.	
Jeremie (Point)	America	Hiſpaniola	18 40 20 N.	74 13 28 W.	4 56 55 W.	
Jeruſalem	Aſia	Paleſtine	31 55 0 N.	35 20 0 E.	2 21 20 E.	
St. Ildefonſo's Iſles	America	Terra del Fuego	55 51 0 S.	69 28 0 W.	4 37 52 W.	
Ilginſkoi	Aſia	Siberia	- - -	104 59 0 E.	6 59 56 E.	
Immer (Iſle)	Aſia	Pacific Ocean	19 16 0 S.	169 46 0 E.	11 19 4 E.	
Ingolſtadt	Europe	Germany	48 45 50 N.	11 25 30 E.	0 45 42 E.	
Ingornahoix	America	Newfoundland	50 37 17 N.	57 15 30 W.	3 49 2 W.	
Johanna (Peak)	Africa	Comora Iſles	12 16 0 S.	44 46 18 E.	2 59 5 E.	
St. John's	America	Antigua	17 4 30 N.	62 9 0 W.	4 8 30 W.	
St. John's	America	Newfoundland	47 32 44 N.	52 25 30 W.	3 29 42 W.	6 0
St. Joſeph	America	California	23 3 37 N.	109 40 45 W.	7 18 43 W.	
Joy (Port)	America	Iſle of St. John's	46 11 0 N.	62 57 15 W.	4 11 49 W.	
Irkutſk	Aſia	Siberia	52 18 8 N.	104 33 30 E.	6 58 14 E.	
Irraname (Iſle)	Aſia	Pacific Ocean	19 31 0 S.	170 21 0 E.	11 21 24 E.	
Iſlamabad	Aſia	India	22 20 0 N.	91 49 43 E.	6 7 19 E.	
Iſle of Pines	Aſia	Pacific Ocean	22 38 0 S.	167 38 0 E.	11 10 32 E.	
Iſlington	Europe	England	51 32 18 N.	0 6 0 W.	0 0 24 W.	
Iſmael	Europe	Turkey	45 20 58 N.	28 50 0 E.	1 55 20 E.	
Iſpahan	Aſia	Perſia	32 24 34 N.	51 50 0 E.	3 27 20 E.	
St. Juan (Cape)	America	Staten Land	54 47 10 S.	63 47 0 W.	4 15 8 W.	
Juan Fernandes (Iſle)	America	Pacific Ocean	33 40 0 S.	78 33 0 W.	5 14 12 W.	
Judda	Aſia	Arabia	21 29 0 N.	39 22 0 E.	2 37 28 E.	
Judomſkoi	Aſia	Siberia	- - -	139 52 30 E.	9 19 30 E.	
St. Julian (Port)	America	Patagonia	49 10 0 S.	68 44 0 W.	4 34 56 W.	4 45
Jupiter's Inlet	America	Anticoſta (Iſle)	49 26 0 N.	63 38 15 W.	4 14 33 W.	
Juthia	Aſia	India	14 18 0 N.	100 50 0 E.	6 43 20 E.	
Kalouga	Europe	Ruſſia	54 30 0 N.	36 5 0 E.	2 24 20 E.	
Kamenec	Europe	Poland	48 40 53 N.	27 1 15 E.	1 48 5 E.	
Keeling's Iſlands	Aſia	Indian Ocean	12 3 15 S.	97 38 30 E.	6 30 34 E.	
Kamtchatkoi-Noſs	Aſia	Kamtchatka	56 1 0 N.	163 22 30 E.	10 53 30 E.	
Karakakoo (Bay)	America	Sandwich Iſles	19 28 10 N.	155 56 23 W.	10 23 46 W.	3 45
Kateringburg	Aſia	Siberia	56 50 15 N.	60 50 0 E.	4 3 20 E.	
Kayes Iſland	America	Pacific Ocean	59 52 0 N.	145 0 0 W.	9 40 0 W.	
Kedgeree	Aſia	India	21 48 0 N	88 50 15 E.	5 55 21 E.	
Keppel's Iſland	Aſia	Pacific Ocean	15 56 30 S.	174 10 24 W.	9 36 42 W.	
Kiam-Cheu	Aſia	China	35 37 0 N.	111 29 15 E.	7 25 57 E.	
Kidnapper's Cape	Aſia	New Zeeland	39 42 45 S.	177 16 0 E.	11 49 4 E.	
Kiel	Europe	Holſtein	54 22 25 N.	9 24 45 E.	0 37 39 E.	
Kinſale	Europe	Ireland	51 41 30 N.	8 28 15 W.	0 33 53 W.	5 0
Kiow	Europe	Ukraine	50 27 0 N.	30 27 30 E.	2 1 50 E.	
Kiringinſkoi	Aſia	Siberia	57 47 0 N.	108 2 0 E.	7 12 8 E.	

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Kirk-Newton	Europe	Scotland	55 54 30 N.	3 30 33 W.	0 14 2 W.	
Kittery Point	America	New England	43 4 27 N.	70 44 30 W.	4 42 58 W.	
Koamaroo (Cape)	Aſia	New Zeeland	41 4 48 S.	174 34 30 E.	11 38 18 E.	
Kola	Europe	Lapland	68 52 26 N.	33 1 30 E.	2 12 6 E.	
Konſwinger	Europe	Norway	60 12 11 N.	11 57 45 E.	0 47 51 E.	
Kormantine Fort	Africa	Gold Coaſt	5 10 58 N.	1 34 24 W.	0 6 18 W.	
Korſar (Lights)	Europe	Denmark	55 20 22 N.	11 8 30 E.	0 44 34 E.	
Koſloff	Europe	Crimea	45 14 0 N.	33 25 0 E.	2 13 40 E.	
Kowima (Upper)	Aſia	Kamtchatka	65 28 0 N.	153 35 0 E.	10 14 20 E.	
Kowima (Lower)	Aſia	Kamtchatka	68 18 0 N.	163 18 0 E.	10 53 12 E.	
Krementzoug	Europe	Ruſſia	49 3 28 N.	33 28 45 E.	2 13 55 E.	
Kronotſkoi-Noſs	Aſia	Kamtchatka	54 43 0 N.	162 13 30 E.	10 48 54 E.	
Kullen (Lights)	Europe	Sweden	56 18 3 N.	12 26 14 E.	0 49 45 E.	
Kurſk	Europe	Ruſſia	51 43 30 N.	36 27 30 E.	2 25 50 E.	
La Ciotat	Europe	France	43 10 29 N.	5 36 48 E.	0 22 27 E.	
Ladrone (Grand)	Aſia	Chineſe Sea	22 2 0 N.	113 56 0 E.	7 35 44 E.	
Lagoon Iſle (Cooke's)	America	Pacific Ocean	18 46 33 S.	138 54 15 W.	9 15 37 W.	
Lagoon's Iſle (Bligh's)	America	Pacific Ocean	21 38 0 S.	140 37 0 W.	9 22 28 W.	
Lagos	Europe	Turkey	40 58 42 N.	25 3 21 E.	1 40 13 E.	
Laguna	Africa	Teneriffe	28 28 31 N.	16 27 13 W.	1 5 49 W.	
Lambhuus	Europe	Iceland	64 6 17 N.	21 54 30 W.	1 27 38 W.	
Lampſaco	Aſia	Turkey	40 20 52 N.	26 36 20 E.	1 46 25 E.	
Lancarota (E. Pt.)	Africa	Canaries	29 14 0 N.	13 26 0 W.	0 53 44 W.	
Landau	Europe	France	49 11 38 N.	8 7 30 E.	0 32 30 E.	
Landſcroon	Europe	Sweden	55 52 23 N.	12 48 0 E.	0 51 12 E.	
Langres	Europe	France	47 52 0 N.	5 19 50 E.	0 21 19 E.	
Laon	Europe	France	49 33 54 N.	3 37 12 E.	0 14 29 E.	
Lavaur	Europe	France	43 40 52 N.	1 49 3 E.	0 7 16 E.	
Lauſanne	Europe	Switzerland	46 31 5 N.	6 45 15 E.	0 27 1 E.	
St. Lawrence's (Iſle)	Aſia	Beering's Straits	63 47 0 N.	171 45 0 E.	11 27 0 E.	
Le Croiſic	Europe	France	47 17 43 N.	2 30 30 W.	0 10 2 W.	
Lectoure	Europe	France	43 55 54 N.	0 37 11 E.	0 2 29 E.	
Leeds	Europe	England	53 47 33 N.	1 38 30 W.	0 6 34 W.	
Leiceſter	Europe	England	52 38 0 N.	1 8 30 W.	0 4 34 W.	
Leipſic	Europe	Saxony	51 22 22 N.	12 20 30 E.	0 49 22 E.	
Le Mans	Europe	France	48 0 35 N.	0 11 49 E.	0 0 47 E.	
Leopard's Iſle	Africa	Sierra Leone	8 40 10 N.	13 8 0 W.	0 52 32 W.	
Leoſtoffe	Europe	England	52 29 0 N.	1 44 9 E.	0 6 57 E.	10 30
Leper's Iſland	Aſia	Pacific Ocean	15 23 30 S.	167 58 15 E.	11 11 53 E.	
Le Puy	Europe	France	45 2 41 N.	3 52 46 E.	0 15 31 E.	
Leſcar	Europe	France	43 19 52 N.	0 26 7 W.	0 1 44 W.	
Leſkeard	Europe	England	50 26 50 N.	4 41 45 W.	0 18 47 W.	
Leſparre	Europe	France	45 18 33 N.	0 57 3 W.	0 3 48 W.	
Lewis Town	America	Pennſylvania	38 47 27 N.	75 15 48 W.	5 1 3 W.	
Leyden	Europe	Holland	52 8 40 N.	4 28 0 E.	0 17 52 E.	
Liege	Europe	Netherlands	50 39 22 N.	5 31 30 E.	0 22 6 E.	
Lilienthal	Europe	Saxony	53 8 25 N.	8 58 0 E.	0 35 52 E.	
Lima	America	Peru	12 1 56 S.	76 54 0 W.	5 7 36 W.	
Limoges	Europe	France	45 49 44 N.	1 15 55 E.	0 5 4 E.	

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Lintz	Europe	Germany	48 16 0 N.	13 57 30 E.	0 55 50 E.	
Liſieux	Europe	France	49 8 50 N.	0 13 32 E.	0 0 54 E.	
Liſle	Europe	Flanders	50 37 50 N.	3 4 16 E.	0 12 17 E.	
Liſbon	Europe	Portugal	38 42 20 N.	9 9 10 W.	0 36 37 E.	
Lion's Bank	Europe	Atlantic Ocean	56 40 0 N.	17 45 0 W.	1 11 0 W.	
Liſburne (Cape)	Aſia	New Hebrides	15 40 45 S.	166 57 0 E.	11 7 48 E.	2 15
Liſburne (Cape)	America	Beering's Straits	69 5 0 N.	165 22 30 W.	11 1 30 W.	
Liverpool	Europe	England	53 22 0 N.	2 56 45 W.	0 11 47 W.	11 18
Livourno	Europe	Italy	43 33 2 N.	10 16 30 E.	0 41 6 E.	
Lizard	Europe	England	49 57 30 N.	5 13 0 W.	0 20 52 W.	7 50
Lizier (St.)	Europe	France	43 0 3 N.	1 8 5 E.	0 4 32 E.	
Loam-pit Hill	Europe	England	51 28 7 N.	0 1 25 W.	0 0 6 W.	
Lodeve	Europe	France	43 43 47 N.	3 18 48 E.	0 13 15 E.	
Loheia	Aſia	Arabia	15 42 8 N.	42 8 30 E.	2 48 34 E.	
Lombez	Europe	France	43 28 21 N.	0 54 24 E.	0 3 38 E.	
London (St. Paul's)	Europe	England	51 30 49 N.	0 5 47 W.	0 0 23 W.	2 45
——— Spital Square	Europe	England	51 31 9 N.	0 4 20 W.	0 0 17 W.	
——— Chriſt's Hoſ.	Europe	England	51 30 52 N.	0 5 51 W.	0 0 23 W.	
——— Mr. Graham's	Europe	England	51 30 52 N.	0 6 10 W.	0 0 25 W.	
——— Surry-ſtr. Ob.	Europe	England	51 30 40 N.	0 6 45 W.	0 0 27 W.	
London Somerſet Place	Europe	England	51 30 43 N.	0 6 54 W.	0 0 28 W.	
——— Saville Houſe	Europe	England	51 30 38 N.	0 7 42 W.	0 0 31 W.	
Londonderry	Europe	Ireland	54 59 28 N.	7 14 49 W.	0 28 59 W.	6 0
Lopatka (Cape)	Aſia	Kamtchatka	51 0 15 N.	156 42 30 E.	10 26 50 E.	
Lorenzo (Cape)	America	Peru	1 2 0 S.	80 59 45 W.	5 23 59 W.	
Loretto	Europe	Italy	43 27 0 N.	13 34 50 E.	0 54 19 E.	
Louis (Port)	America	Hiſpaniola	18 18 40 N.	73 16 49 W.	4 53 7 W.	
Louis (Port)	Africa	Mauritius	20 9 44 S.	57 28 15 E.	3 49 53 E.	
Louiſburg	America	Cape Breton	45 53 50 N.	59 59 15 W.	3 59 57 W.	
Louveau	Aſia	India	12 42 30 N.	101 1 30 E.	6 44 6 E.	
Louvain	Europe	Netherlands	50 53 26 N.	4 41 32 E.	0 18 46 E.	
Lubni	Europe	Ruſſia	50 0 37 N.	33 3 30 E.	2 12 14 E.	
St. Lucar (Cape)	America	Mexico	22 45 0 N.	110 0 0 W.	7 20 0 W.	
St. Lucia (Iſle)	America	Antilles	13 24 30 N.	60 51 30 W.	4 3 26 W.	
Lucipara	Aſia	Straits of Banka	3 11 20 S.	106 18 46 E.	7 5 15 E.	
St. Lunaire Bay	America	Newfoundland	51 29 0 N.	55 30 0 W.	3 42 0 W.	
Lunden	Europe	Sweden	55 42 13 N.	13 11 5 E.	0 52 44 E.	
Luneville	Europe	France	48 35 33 N.	6 30 6 E.	0 26 0 E.	
Luſon	Europe	France	46 27 15 N.	1 10 0 W.	0 4 40 W.	
Luxembourg	Europe	Netherlands	49 37 20 N.	6 13 45 E.	0 24 55 E.	
Lydd	Europe	England	50 57 7 N.	0 54 15 E.	0 3 37 E.	
Lynn Regis	Europe	England	52 45 34 N.	0 24 29 E.	0 1 38 E.	6 45
Lyons	Europe	France	45 45 52 N.	4 49 9 E.	0 19 17 E.	
Macao (Pia Grand)	Aſia	China	22 11 20 N.	113 35 15 E.	7 34 15 E.	5 50
Macaſſar	Aſia	Celebes	5 9 0 S.	119 48 45 E.	7 59 15 E.	
Macclesfield Shoal	Aſia	Chineſe Sea	15 51 18 N.	114 18 0 E.	7 37 12 E.	
Macon	Europe	France	46 18 27 N.	4 49 53 E.	0 19 20 E.	
Madeira (Funchal)	Africa	Atlantic Ocean	32 37 20 N.	16 55 36 W.	1 7 42 W.	12 4
Madras	Aſia	India	13 4 54 N.	80 24 49 E.	5 21 39 E.	

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Madre de Dios (Port)	America	Marqueſas	9 55 30 S.	139 8 40 W.	9 16 35 W.	2 30
Madrid	Europe	Spain	40 25 18 N.	3 38 30 W.	0 14 34 W.	
Maeſtricht	Europe	Netherlands	50 51 7 N.	5 40 45 E.	0 22 43 E.	
Mafamale	Africa	Zanquebar	16 21 0 S.	40 20 30 E.	2 41 22 E.	
Magdalen (Iſles)	America	G. St. Lawrence	47 17 0 N.	61 26 0 W.	4 5 44 W.	
Magdalena (Iſle)	America	Pacific Ocean	10 25 30 S.	138 49 0 W.	9 15 16 W.	
Mahon (Port)	Europe	Minorca	39 51 48 N.	3 48 30 E.	0 15 14 E.	
Majorca (Iſle)	Europe	Mediterranean Sea	39 35 0 N.	2 29 45 E.	0 9 59 E.	
Maize (Cape)	America	Cuba	20 18 0 N.	74 23 0 W.	4 57 32 W.	
Malacca	Aſia	India	2 12 6 N.	102 8 45 E.	6 48 35 E.	
Malicoy (Iſland)	Aſia	Indian Ocean	8 15 30 N.	73 9 30 E.	4 52 38 E.	
Mallicola (Iſle)	Aſia	Pacific Ocean	16 15 30 S.	167 39 15 E.	11 10 37 E.	
Maloes (St.)	Europe	France	48 39 3 N.	2 1 26 W.	0 8 6 W.	6 0
Malmoe	Europe	Sweden	55 36 37 N.	13 1 4 E.	0 52 4 E.	
Malta (Town)	Africa	Mediterranean Sea	35 53 50 N.	14 28 30 E.	0 57 54 E.	
Mancheſter	Europe	England	53 26 30 N.	2 15 0 W.	0 9 0 W.	
Mangalore	Aſia	Malabar	12 50 0 N.	74 57 24 E.	4 59 50 E.	
Mangeea (Iſle)	America	Pacific Ocean	21 56 45 S.	158 3 0 W.	10 32 12 W.	
Manheim	Europe	Germany	49 28 59 N.	8 27 22 E.	0 33 49 E.	
Manilla	Aſia	Philippines	14 36 8 N.	120 51 15 E.	8 3 25 E.	
Mansfelt (Iſle)	America	Hudſon's Bay	62 38 30 N.	80 33 0 W.	5 22 12 W.	
Maria V. Diem. (C.)	Aſia	New Zeeland	34 29 15 S.	172 46 30 N.	11 31 16 E.	
St. Marcou (Iſle)	Europe	France	49 29 52 N.	1 8 56 W.	0 4 36 W.	
Marigalante (Iſle)	America	Atlantic Ocean	15 55 15 N.	61 11 0 W.	4 4 44 W.	
Marmara (Iſle)	Aſia	Sea of Marmara	40 37 4 N.	27 30 35 E.	1 50 2 E.	
Marpurg	Europe	Germany	46 34 42 N.	15 41 20 E.	1 2 45 E.	
Marſeilles	Europe	France	43 17 43 N.	5 22 12 E.	0 21 29 E.	
St. Martha	America	Terra Firma	11 19 2 N.	74 4 30 W.	4 56 18 W.	
St. Martin's Cape	Africa	St. Helen's Bay	32 41 43 S.	17 55 0 E.	1 11 40 E.	
St. Martin's Iſle	America	Caribbean Sea	18 4 20 N.	63 2 0 W.	4 12 8 W.	
Martinico (Iſle)	America	Weſt Indies	14 44 0 N.	61 21 16 W.	4 5 25 W.	
Martin-Vaz	America	Atlantic Ocean	20 28 16 S.	29 1 0 W.	1 56 4 W.	3 45
St. Mary's Iſle	Europe	Scilly Iſles	49 55 30 N.	6 16 45 W.	0 25 7 W.	
St. Mary's Town	Europe	Azores	36 56 40 N.	25 9 10 W.	1 40 37 W.	
Mas-a-fuero (Iſle)	America	Pacific Ocean	33 45 0 S.	80 22 0 W.	5 21 28 W.	
Maſkelyne's Iſles	Aſia	New Hebrides	16 32 0 S.	167 59 15 E.	11 11 57 E.	
Maſulipatam	Aſia	India	16 8 30 N.	81 11 45 E.	5 24 47 E.	
St. Matthew's Light	Europe	France	48 19 34 N.	4 45 54 W.	0 19 4 W.	
Mauritius (Pt. Louis)	Africa	Indian Ocean	20 9 45 S.	57 29 15 E.	3 49 57 E.	
Maurua (Iſle)	America	Pacific Ocean	16 25 40 S.	152 32 40 W.	10 10 11 W.	
Mayence	Europe	Germany	49 54 0 N.	8 20 0 E.	0 33 20 E.	
Mayne's (John) Iſle	Europe	Northern Ocean	71 10 0 N.	9 49 30 W.	0 39 18 W.	
Mayo (Iſle)	Africa	Cape Verd	15 12 40 N.	23 14 7 W.	1 32 56 W.	
Mayotta (Peak)	Africa	Comora Iſles	12 59 15 S.	45 25 0 E.	3 1 40 E.	
Meaux	Europe	France	48 57 40 N.	2 52 30 E.	0 11 30 E.	
Mechlin	Europe	Netherlands	51 1 50 N.	4 28 45 E.	0 17 55 E.	
Mende	Europe	France	44 31 2 N.	3 29 35 E.	0 13 58 E.	
Mercury Bay	Aſia	New Zeeland	36 48 0 S.	176 6 20 E.	11 44 25 E.	
Mergui	Aſia	Siam	12 10 30 N.	98 19 15 E.	6 33 17 E.	
Meſurado Bay	Africa	Grain Coaſt	6 18 20 N.	10 49 0 W.	0 43 16 W.	
Metz	Europe	France	49 7 10 N.	6 10 13 E.	0 24 41 E.	

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Mew-Stone	Aſia	New Holland	43 47 15 S.	146 26 30 E.	9 45 46 E.	
Mexico	America	Mexico	19 54 0 N.	99 41 45 W.	6 38 47 W.	
Mezieres	Europe	France	49 45 47 N.	4 43 16 E.	0 18 53 E.	
Miatea (Iſle)	America	Pacific Ocean	17 52 20 S.	148 6 0 W.	9 52 24 W.	
St. Michael's Iſle	Europe	Azores	37 47 0 N.	25 42 0 W.	1 42 48 W.	
Middleburg	Europe	Zealand	51 30 6 N.	3 36 35 E.	0 14 26 E.	
Middleburg (Iſle)	Aſia	Friendly Iſles	21 20 30 S.	174 34 0 W.	11 38 16 W.	
Milan	Europe	Italy	45 28 0 N.	9 10 52 E.	0 36 43 E.	
Milo (Iſle)	Europe	Mediterranean Sea	36 41 0 N.	20 0 0 E.	1 40 0 E.	
Minſter	Europe	England	51 19 50 N.	1 18 46 E.	0 5 15 E.	
Mirepoix	Europe	France	48 5 7 N.	1 52 11 E.	0 7 29 E.	
Mirroe (Iſle)	Aſia	Bengal Bay	7 29 0 N.	93 37 30 E.	6 14 30 E.	
Mittau	Europe	Courland	56 39 10 N	23 42 45 E.	1 34 51 E.	
Mocca	Aſia	Arabia	13 16 0 N.	44 0 0 E.	2 56 0 E.	
Mocha (Iſle)	America	Pacific Ocean	38 22 30 N.	74 37 0 W.	4 58 28 W.	
Modena	Europe	Italy	44 34 0 N.	11 12 30 E.	0 44 50 E.	
Mohilew	Europe	Ruſſia	53 54 0 N	30 24 30 E.	2 1 38 E.	
Monopin Hill	Aſia	Banka	2 1 20 S.	105 21 7 E.	7 1 24 E.	
Mons	Europe	Netherlands	50 27 10 N.	3 57 15 E.	0 15 49 E.	
Monſieurs	Aſia	Borneo	4 23 40 S.	115 34 45 E.	7 42 19 E.	
Montague (Cape)	America	Sandwich Land	58 33 0 S.	126 46 0 W.	1 47 4 W.	
Montagu (Iſle)	Aſia	New Hebrides	17 26 0 S.	168 31 30 E.	11 14 6 E.	
Montalto	Europe	Italy	42 59 44 N.	13 35 14 E.	0 54 21 E.	
Montauban	Europe	France	44 0 55 N.	1 20 51 E.	0 5 23 E.	
Monte-Chriſti	America	Peru	1 2 0 S.	80 49 15 W.	5 23 17 W.	
Montego Bay	America	Jamaica	18 31 0 N.	78 20 0 W.	5 13 20 W.	
Monterrey	America	New Albion	36 36 20 N.	121 34 15 W.	8 6 17 W.	7 30
Montlambert	Europe	France	50 43 2 N.	1 38 45 E.	0 6 35 E.	
Montmirail	Europe	France	48 52 8 N.	3 32 16 E.	0 14 9 E.	
Montpelier	Europe	France	44 36 29 N.	3 51 45 E.	0 15 27 E.	
Montſerrat (Iſle)	America	Caribbean Sea	16 49 0 N.	62 27 0 W.	4 9 48 W.	
Monument (The)	Aſia	New Hebrides	17 14 15 S.	168 38 15 E.	11 14 33 E.	
Mooſe Fort	America	New Wales	51 15 54 N.	80 54 41 W.	5 23 39 W.	
Morant (Point)	America	Jamaica	17 58 0 N.	76 15 45 W.	5 5 3 W.	
Morokinnee	America	Sandwich Iſles	20 39 0 N.	156 29 30 W.	10 25 58 W.	
Morotoi	America	Sandwich Iſles	21 10 0 N.	157 17 0 W.	10 29 8 W.	
Moſcow	Europe	Moſcovy	55 45 20 N.	37 46 15 E.	2 31 5 E.	
Moſdok	Europe	Ruſſia	43 43 23 N.	43 50 0 E.	2 55 20 E.	10 15
Moſketto Cove	America	Greenland	64 55 13 N.	52 56 45 W.	3 31 47 W.	
Moulins	Europe	France	46 34 4 N.	3 20 0 E.	0 13 20 E.	
Mount (Cape)	Africa	Grain Coaſt	6 46 0 N.	11 48 0 W.	0 47 12 W.	
Mowee (Eaſt Point)	America	Sandwich Iſles	20 50 30 N.	155 55 0 W.	10 23 40 W.	
Mowee (Weſt Point)	America	Sandwich Iſles	20 53 30 N.	156 38 30 W.	10 26 34 W.	
Mulgrave (Point)	America	Beering's Straits	67 45 30 N.	165 12 0 W.	11 0 48 W.	
Munich	Europe	Bavaria	48 7 37 N.	11 32 30 E.	0 46 10 E.	
Muſwell Hill	Europe	England	51 35 32 N.	0 7 20 W.	0 0 29 W.	
Nagpour	Aſia	India	21 8 30 N.	79 46 0 E.	5 19 4 E.	
Namur	Europe	Netherlands	50 28 3 N.	4 47 45 E.	0 19 11 E.	
Nancovery Harbour	Aſia	Nicobar Iſles	7 58 0 N.	93 26 0 E.	6 13 44 E.	
Nancy	Europe	France	48 41 55 N.	6 10 15 E.	0 24 41 E.	

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			° ′ ″	° ′ ″	H. M. S.	H. M.
Nangaſachi - -	Aſia -	Japan - -	32 32 0 N.	128 46 15 E.	8 35 5 E.	
Nankin - -	Aſia -	China - -	32 4 40 N.	118 47 0 E.	7 55 8 E.	
Nantes - -	Europe -	France - -	47 13 7 N.	1 33 0 W.	0 6 12 W.	3 0
Naples - -	Europe -	Italy - -	40 50 15 N.	14 18 0 E.	0 57 22 E.	
Narbonne - -	Europe -	France - -	43 10 58 N.	3 0 0 E.	0 12 0 E.	
Narcondam - -	Aſia -	Bengal Bay -	13 25 15 N.	94 7 0 E.	6 16 28 E.	
Narva - -	Europe -	Livonia - -	59 23 27 N.	28 21 45 E.	1 53 27 E.	
Navaſſa (Iſle) -	America -	Atlantic Ocean	18 23 30 N.	75 1 18 W.	5 0 5 W.	
Needles (Lighthouſe)	Europe -	Iſle of Wight -	50 39 53 N.	1 33 55 W.	0 6 16 W.	10 30
Negapatam - -	Aſia -	India - -	10 46 0 N.	79 43 26 E.	5 19 14 E.	
Negrais (Cape) -	Aſia -	India - -	15 56 30 N.	94 18 0 E.	6 17 12 E.	
Neſchin - -	Europe -	Ruſſia - -	51 2 45 N.	31 49 30 E.	2 7 18 E.	
Neuſtadt - -	Europe -	Auſtria - -	47 48 27 N.	16 13 17 E.	1 4 53 E.	
Nevers - -	Europe -	France - -	46 59 17 N.	3 9 16 E.	0 12 37 E.	
Newbury - -	America -	New England -	43 2 0 N.	70 37 3 W.	4 42 30 W.	
Newenham (Cape) -	America -	Beering's Straits	58 41 30 N.	162 19 30 W.	10 49 18 W.	
Newington (Stoke) -	Europe -	England - -	51 33 40 N.	0 4 59 W.	0 0 20 W.	
Newtee (Point) -	Aſia -	India - -	15 56 0 N.	73 36 0 E.	4 54 24 E.	
New-werk (Iſle) -	Europe -	Lower Saxony -	53 55 19 N.	8 31 9 E.	0 34 6 E.	
New-year's Harbour	America -	Staten Land -	54 48 55 S.	64 11 0 W.	4 16 44 W.	
Nice - -	Europe -	Italy - -	43 41 47 N.	7 16 22 E.	0 29 5 E.	
Nicholas Mole (St.) -	America -	Hiſpaniola -	19 49 20 N.	73 29 45 W.	4 53 59 W.	
Nicobar (Great) -	Aſia -	Bengal Bay -	7 4 0 N.	93 44 0 E.	6 14 56 E.	
Nicobar (Car) -	Aſia -	Bengal Bay -	9 10 0 N.	92 50 0 E.	6 11 20 E.	
Nieuport - -	Europe -	Flanders - -	51 7 41 N.	2 45 5 E.	0 11 0 E.	11 45
Ningpo - -	Aſia -	China - -	29 57 45 N.	120 18 0 E.	8 1 12 E.	
Nimes - -	Europe -	France - -	43 50 12 N.	4 18 39 E.	0 17 15 E.	
Noir (Cape) -	America -	Terra del Fuego	54 32 30 S.	73 3 15 W.	4 52 13 W.	
Noirmoutier (Iſle) -	Europe -	France - -	47 0 5 N.	2 14 22 W.	0 8 57 W.	
Nootka Sound -	America -	Pacific Ocean -	49 36 7 N.	126 42 10 W.	8 26 41 W.	0 20
Norburg - -	Europe -	Denmark -	55 3 43 N.	9 45 18 E.	0 39 1 E.	
Norfolk Iſland -	Aſia -	Pacific Ocean -	29 1 45 S.	168 10 0 E.	11 12 40 E.	
Noriton - -	America -	Pennſylvania -	40 9 56 N.	75 28 30 W.	5 1 54 W.	
North Cape - -	Europe -	Lapland - -	71 10 30 N.	25 49 0 E.	1 43 16 E.	3 44
North (Cape) -	America -	South Georgia -	54 4 45 S.	38 5 0 W.	2 33 0 W.	
North (Cape) -	Aſia -	Beering's Straits	68 56 0 N.	179 11 30 W.	11 56 46 W.	
North Iſland -	Aſia -	Straits of Sunda	5 37 5 S.	105 55 0 E.	7 3 40 E.	
North Iſland -	Aſia -	Chineſe Sea -	25 14 0 N.	141 14 0 E.	9 24 56 E.	
Norton's Sound -	America -	Beering's Straits	64 30 30 N.	162 47 30 W.	10 51 10 W.	
Noyon - -	Europe -	France - -	49 34 59 N.	2 59 48 E.	0 11 59 E.	
Nuremberg - -	Europe -	Germany -	49 27 3 N.	11 0 45 E.	0 44 3 E.	
Oaitipeha Bay -	America -	Otaheite - -	17 45 45 S.	149 8 57 W.	9 56 36 W.	
Ochotſk - -	Aſia -	Tartary - -	59 20 10 N.	143 12 30 E.	9 32 50 E.	
Ohamaneno Harbour	America -	Uliteah - -	16 45 30 S.	151 37 31 W.	10 6 30 W.	11 30
Oheteroæ (Iſle) -	America -	Pacific Ocean -	22 26 36 S.	150 48 45 W.	10 3 15 W.	
Ohevahoa (Iſle) -	America -	Marqueſas -	9 40 40 S.	139 1 40 W.	9 16 7 W.	
Ohitahoo (Iſle) -	America -	Marqueſas -	9 55 30 S.	139 6 0 W.	9 16 24 W.	2 30
Oldenburg - -	Europe -	Weſtphalia -	53 8 40 N.	8 14 20 E.	0 32 57 E.	
Oleron - -	Europe -	France - -	43 11 1 N.	0 36 30 W.	0 2 26 W.	

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			° ′ ″	° ′ ″	H. M. S.	H. M.
Oleron (Iſle)	Europe	France	46 2 51 N.	1 24 27 W.	0 5 38 W.	
Olinde	America	Braſil	8 13 0 S.	35 5 30 W.	2 20 22 W.	
Olonſe (Sableſo)	Europe	France	46 29 52 N.	1 47 5 W.	0 7 8 W.	
Omergon (Tower)	Aſia	India	20 10 30 N.	72 56 30 E.	4 51 46 E.	
Omer's (St.)	Europe	France	50 44 52 N.	2 14 67 E.	0 9 0 E.	
Onateayo (Iſle)	America	Marqueſas	9 58 0 N.	138 51 0 W.	9 15 24 W.	
Onecheow (Iſle)	America	Sandwich Iſles	21 49 30 N.	160 13 30 W.	10 40 54 W.	
Oonalaſka	America	Beering's Straits	53 54 29 N.	166 22 15 W.	11 5 29 W.	
Oonemak (Cape)	America	Beering's Straits	54 30 30 N.	165 31 0 W.	11 10 4 W.	
Opara (Iſle)	America	Pacific Ocean	27 36 0 S.	144 8 32 W.	9 36 34 W.	
Oporto	Europe	Portugal	41 10 0 N.	8 22 0 W.	0 33 28 W.	
Orange	Europe	France	44 8 10 N.	4 48 8 E.	0 19 13 E.	
Oreehoua	America	Sandwich Iſles	22 3 0 N.	160 6 30 W.	10 40 26 W.	
Orel	Europe	Ruſſia	52 56 40 N.	35 57 0 E.	2 23 48 E.	
Orenburg	Aſia	Tartary	51 46 3 N.	55 7 35 E.	3 40 30 E.	
Orford (Cape)	America	Pacific Ocean	42 52 0 N.	124 25 0 W.	8 17 40 W.	
Orford-Neſs	Europe	England	52 4 30 N.	1 28 1 E.	0 5 52 E.	
Orleans	Europe	France	47 54 10 N.	1 54 27 E.	0 7 38 E.	
Orleans (New)	America	Louiſiana	29 57 45 N.	89 58 45 W.	5 59 55 W.	
Oratava	Africa	Teneriffe	28 23 35 N.	16 35 35 W.	1 6 22 W.	
Orſk	Aſia	Tartary	51 12 32 N.	58 32 0 E.	3 54 8 E.	
Ortegal (Cape)	Europe	Spain	43 46 37 N.	7 38 0 W.	0 30 32 W.	
Oſimo	Europe	Italy	43 29 36 N.	13 27 8 E.	0 53 49 E.	
Oſnaburg	Europe	Germany	52 16 14 N.	7 47 30 E.	0 31 10 E.	
Oſnaburg (Iſle)	America	Pacific Ocean	17 52 20 S.	148 6 0 W.	9 52 24 E.	
Oſtend	Europe	Netherlands	51 15 10 N.	2 56 30 E.	0 11 46 E.	11 45
Oſtia	Europe	Italy	41 45 35 N.	12 16 20 E.	0 49 5 E.	
Otakootaia (Iſle)	America	Pacific Ocean	19 51 30 S.	158 23 0 W.	10 33 32 W.	
Overbierg	Europe	Norway	59 6 52 N.	11 22 15 E.	0 45 29 E.	
Ower Rocks	Europe	England	50 39 57 N.	0 40 0 W.	0 2 40 W.	
Owharre Bay	America	Huahine	16 42 46 S.	151 9 6 W.	10 4 36 W.	11 50
Owhyhee N. Point	America	Sandwich Iſles	20 17 0 N.	155 59 0 W.	10 23 56 W.	
Owhyhee S. Point	America	Sandwich Iſles	18 54 30 N.	155 48 0 W.	10 23 12 W.	
Owhyhee E. Point	America	Sandwich Iſles	19 33 0 N.	154 52 0 W.	10 19 28 W.	
Oxford Obſervatory	Europe	England	51 45 38 N.	1 15 0 W.	0 5 0 W.	
Paddleſworth	Europe	England	51 6 50 N.	1 8 9 E.	0 4 33 E.	
Padua	Europe	Italy	45 23 40 N.	11 52 56 E.	0 47 32 E.	
Paimbœuf	Europe	France	47 17 15 N.	2 1 46 W.	0 8 7 W.	
Paita	America	Peru	5 12 0 S.			
Paix (Port)	America	Hiſpaniola	19 56 0 N.	72 52 15 W.	4 51 29 W.	
Palermo	Europe	Sicily	38 6 45 N.	13 20 15 E.	0 53 21 E.	
Palliſer (Cape)	Aſia	New Zeeland	41 38 0 S.	175 23 12 E.	11 41 33 E.	
Palliſer's Iſles	America	Pacific Ocean	15 38 15 S.	146 30 15 W.	9 46 1 W.	
Palliſer (Port)	Africa	Kerguelen's Land	49 3 15 S.	69 35 6 E.	4 38 20 E.	
Palma (Iſle)	Africa	Canaries	28 36 45 N.	17 49 6 W.	1 11 16 W.	
Palmas (Cape)	Africa	Grain Coaſt	4 30 0 N.	7 41 0 W	0 30 44 W.	
Palmerſton's Iſle	America	Pacific Ocean	18 0 30 S.	163 12 0 W.	10 52 48 W.	
Palmiras (Point)	Aſia	India	20 44 0 N.	87 1 26 E.	5 48 6 E.	9 30
Palmiers	Europe	France	43 6 44 N.	1 36 21 E.	0 6 25 E.	

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Panama	America	Mexico	8 58 12 N.	80 15 15 W.	5 21 1 W.	
Paoom (Iſle)	Aſia	New Hebrides	16 30 0 S.	168 28 45 E.	11 13 55 E.	
Para	America	River Amazons	1 28 0 S.	48 40 0 W.	3 14 40 W.	
Paris (Obſervatory)	Europe	France	48 50 14 N.	2 20 0 E.	0 9 20 E.	
Parma	Europe	Italy	44 44 50 N.	10 26 30 E.	0 41 56 E.	
Paſſado	America	Peru	0 10 0 S.	82 0 0 W.	5 28 0 W.	
Patrixfiord	Europe	Iceland	65 35 45 N.	24 10 0 W.	1 36 40 W.	
Pau	Europe	France	43 15 0 N.	0 9 0 W.	0 0 36 W.	
Pavia	Europe	Italy	45 10 59 N.	9 11 30 E.	0 36 46 E.	
St. Paul's Iſle	Africa	Indian Ocean	38 44 0 S.	77 18 0 E.	5 9 12 E.	
St. Paul de Leon	Europe	France	48 41 24 N.	3 58 37 W.	0 15 54 W.	4 0
Pednathias Head	Europe	Scilly Iſles	49 52 2 N.			
Pedra Blanca	Aſia	Chineſe Sea	22 16 0 N.	115 22 57 E.	7 41 32 E.	
Pedra Branca	Aſia	Straits of Malacca	1 18 0 N.	104 31 49 E.	6 58 7 E.	
Pedra (Point)	Aſia	Ceylon	39 52 0 N.	80 27 0 E.	5 21 48 E.	
Pekin	Aſia	China	39 54 47 N.	116 24 51 E.	7 45 39 E.	
Pellew Iſles	Aſia	Chineſe Sea	7 19 0 N.	134 40 0 E.	8 58 40 E.	
Pello	Europe	Finland	66 48 16 N.	23 58 15 E.	1 35 53 E.	
Pera (Pulo)	Aſia	Straits of Malacca	- - -	99 8 30 E.	6 36 34 E.	
Perigueux	Europe	France	45 11 8 N.	0 43 19 E.	0 2 53 E.	
Perinaldo	Europe	Italy	43 53 20 N.	7 42 45 E.	0 30 51 E.	
Permera (Rocks)	Aſia	Indian Ocean	13 13 0 N.	74 44 0 E.	4 58 56 E.	
Peros Banhos	Aſia	Indian Ocean	5 22 0 N.	71 53 0 E.	4 47 32 E.	
Perpetua (Cape)	America	Pacific Ocean	44 4 30 N.	124 14 0 W.	8 16 56 W.	
Perpignan	Europe	France	42 41 53 N.	2 53 35 E.	0 11 34 E.	
Peſaro	Europe	Italy	43 55 1 N.	12 53 21 E.	0 51 33 E.	
St. Peterſburgh	Europe	Ruſſia	59 56 23 N.	30 19 15 E.	2 1 17 E.	
St. Peter's Fort	America	Martinico	14 44 0 N.	61 21 16 E.	4 5 25 W.	
St. Peter's Iſle	America	Atlantic Ocean	46 46 30 N.	56 17 0 W.	3 45 8 W.	
St. Peter and Paul	Aſia	Kamtchatka	53 0 37 N.	158 44 30 E.	10 34 58 E.	4 36
Petit Goave	America	Hiſpaniola	18 27 0 N.	72 45 34 W.	4 51 2 W.	
Petroſawodſk	Europe	Ruſſia	61 47 4 N.	34 23 30 E.	2 17 34 E.	
Pettaw	Europe	Styria	46 26 21 N.	15 59 15 E.	1 3 57 E.	
Petworth	Europe	England	50 59 17 N.	0 36 26 W.	0 2 26 W.	
Pevenſey	Europe	England	50 49 12 N.	0 20 14 F.	0 1 21 E.	
Philadelphia	America	Pennſylvania	39 56 54 N.	75 13 45 W.	5 0 55 W.	3 00
Philip (Straits)	Europe	Flanders	51 16 55 N.	3 45 12 E.	0 15 1 E.	
St. Philip's Fort	Europe	Minorca	39 50 46 N.	3 48 30 E.	0 15 14 E.	
Philipſburg	Europe	Germany	49 14 1 N.	8 26 34 E.	0 33 46 E.	
Philipville	Europe	Netherlands	50 11 19 N.	4 32 19 E.	0 18 9 E.	
Pickerſgill's Harbour	Aſia	New Zeeland	45 47 27 S.	166 18 9 E.	11 5 13 E.	10 57
Pickerſgill's Iſle	America	Atlantic Ocean	54 42 30 S.	36 58 0 W.	2 27 52 W.	
Pico	Europe	Azores	38 26 52 N.	28 27 40 W.	1 53 51 W.	
Pines (Iſle of)	Aſia	New Caledonia	22 38 0 S.	167 38 0 E.	11 10 32 E.	
Piſa	Europe	Italy	43 43 7 N.	10 22 52 E.	0 41 31 E.	
Piſcadores	Aſia	Pacific Ocean	11 15 0 N.	167 20 20 E.	11 9 21 E.	
Plate-Rack N.E. Pt.	America	Weſt Indies	20 31 0 N.	69 33 0 W	4 38 12 W.	
Plate-Rack S. Point	America	Weſt Indies	20 13 35 N.	69 37 45 W	4 38 31 W.	
Plate-Rack N.W. Pt.	America	Weſt Indies	20 30 0 N.	70 4 30 W	4 40 18 W.	
Plymouth	Europe	England	50 22 30 N.	4 12 45 W	0 16 51 W.	6 0

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Poitiers	Europe	France	46 34 50 N.	0 20 48 E.	0 1 23 E.	
Pollingen	Europe	Germany	47 48 17 N.	11 7 30 E.	0 44 30 E.	
Pondicherry	Aſia	India	11 55 41 N.	79 51 30 E.	5 19 26 E.	
Ponoi	Europe	Lapland	67 4 30 N.	41 7 45 E.	2 44 31 E.	
Pontoiſe	Europe	France	49 3 2 N.	2 5 37 E.	0 8 22 E.	
Pool	Europe	England	50 42 50 N.	1 58 55 W.	0 7 56 W.	
Poolytopu	Aſia	India	8 8 0 N	77 15 45 E.	5 9 3 E.	
Popayan	America	New Granada	2 27 30 N.	76 16 15 W.	5 5 5 W.	
Port au Prince	America	Hiſpaniola	18 33 42 N.	72 27 33 W.	4 49 50 W.	
Portland (Point)	Europe	England	50 31 0 N.	2 29 0 W.	0 9 56 W.	
Portland (Iſle)	Europe	North Sea	63 22 0 N.	18 54 0 W.	1 15 36 W.	
Portland (Iſle)	Aſia	Pacific Ocean	39 24 40 S.	177 51 45 E.	11 51 27 E.	
Porto	Europe	Italy	41 46 44 N.	12 14 10 W.	0 48 57 W.	
Porto Bello	America	Mexico	9 33 30 N.	79 44 15 W.	5 18 57 W.	
Porto Novo	Aſia	India	11 30 0 N.	79 45 30 E.	5 19 2 E.	
Porto Praya	Africa	St. Jago	14 53 30 N.	23 30 17 W.	1 34 1 W.	11 0
Porto Rica N.E. Pt.	America	Weſt Indies	18 29 0 N.	65 51 25 W.	4 23 26 W.	
Porto Rica N.W. Pt.	America	Weſt Indies	18 31 30 N.	67 18 0 W.	4 29 12 W.	
Porto Sancto (Iſle)	Africa	Atlantic Ocean	33 5 35 N.	16 14 51 W.	1 4 59 W.	
Port Paix	America	Hiſpaniola	19 56 30 N.	72 58 0 W.	4 51 52 W.	
Port Praſlin	Aſia	New Britain	4 49 27 S.	153 6 30 E.	10 12 26 E.	
Port Royal	America	Jamaica	18 0 0 N.	76 44 45 W.	5 6 59 W.	
Port Royal	America	Martinico	14 35 55 N.	61 9 0 W.	4 4 36 W.	
Portſmouth Town	Europe	England	50 47 27 N.	1 5 57 W.	0 4 24 W.	11 15
Portſmouth Academy	Europe	England	50 48 2 N.	1 6 18 W.	0 4 25 W.	
Portſmouth	America	New England	43 4 15 N.	70 43 15 W.	4 42 53 W.	
Poſen	Europe	Poland	52 26 0 N.	15 0 15 E.	1 0 1 E.	
Prague	Europe	Bohemia	50 53 4 N.	14 25 15 E.	0 57 41 E.	
Praters N.E. Point	Aſia	Chineſe Sea	20 57 30 N.	116 57 30 E.	7 47 50 E.	
Praters S.W. Point			20 42 0 N.	116 40 0 E.	7 46 40 E.	
Praule	Europe	England	50 14 0 N.	3 49 15 W.	0 15 17 W	
Preparis (Iſle)	Aſia	Bay of Bengal	14 48 0 N.	93 34 0 E.	6 14 16 E.	
Preſburgh	Europe	Hungary	48 8 7 N.	17 10 30 E.	1 8 42 E.	
Prince's Iſland	Aſia	Straits of Sunda	6 35 10 S.	105 14 20 E.	7 0 57 E.	
Prince's Iſland	Africa	Atlantic Ocean	1 37 0 N.	7 40 0 E.	1 30 40 E.	
Prince of Wales's Fort	America	New Wales	58 47 32 N.	94 13 55 W.	6 16 56 W.	7 20
Prince of Wales's Cape	America	Beering's Straits	65 45 30 N.	168 17 30 W.	11 13 10 W.	
P. W. Henry's Iſle	America	Pacific Ocean	19 0 0 N.	141 22 0 W.	9 25 28 W.	
Providence	America	New England	41 50 41 N.	71 22 0 W.	4 45 28 W.	
Pudyona	Aſia	New Caledonia	20 18 0 S.	164 41 14 E.	10 58 45 E.	6 30
Pyleſtaart's Iſland	Aſia	Pacific Ocean	22 23 30 N.	175 49 30 W.	11 43 18 W.	
Quebec	America	Canada	46 48 38 N.	71 5 29 W.	4 44 22 W.	7 30
Quibo (Iſle)	America	Pacific Ocean	7 27 0 N.	82 10 0 W.	5 28 40 W.	3 30
Quilloan	Aſia	India	8 52 30 N.	76 37 30 E.	5 6 30 E.	
Quimper	Europe	France	47 58 29 N.	4 6 0 W.	0 16 24 W.	
St. Quinton	Europe	France	49 50 51 N.	3 17 23 E.	0 13 10 E.	
Quiros (Cape)	Aſia	New Hebrides	14 56 8 S.	167 20 0 E.	11 9 20 E.	
Quito	America	Peru	0 13 27 S.	78 10 15 W.	5 12 41 W.	

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Race (Cape)	America	Newfoundland	46 40 0 N.	53 3 30 W.	3 32 14 W.	
Rakah (Ancient)	Aſia	Meſopotamia	36 1 0 N.	38 50 0 E.	2 35 20 E.	
Ramhead	Europe	England	50 18 24 N.	4 17 30 W.	0 17 10 E.	
Ramſgate	Europe	England	51 19 31 N.	1 24 41 E.	0 5 39 E.	
Ranai (Iſle)	America	Sandwich Iſles	20 46 30 N.	156 55 30 W.	10 27 42 W.	
Randers	Europe	Denmark	56 27 48 N.	10 3 27 E.	0 40 14 E.	
Ratiſbon	Europe	Germany	49 0 0 N.	12 6 25 E.	0 48 26 E.	
Ravenna	Europe	Italy	44 25 5 N.	12 10 36 E.	0 48 42 E.	
Recanati	Europe	Italy	43 25 44 N.	13 31 8 E.	0 54 5 E.	
Recif	America	Braſil	8 10 0 N.	35 35 0 W.	2 22 20 W.	
Reculver	Europe	England	51 22 47 N.	1 11 50 E.	0 4 47 E.	
Red-Buoy	Europe	Mouth of the Elbe	53 39 0 N.			
Refuge (Port)	Aſia	Bligh's Iſlands	18 38 30 S.	173 56 0 W.	11 31 44 W.	
Reikianeſs (Cape)	Europe	Iceland	63 55 0 N.	22 47 30 W.	1 31 10 W.	
Rennes	Europe	France	48 6 50 N.	1 41 30 W.	0 6 46 W.	
Reſolution Bay	America	Marqueſas	9 55 30 S.	139 8 40 W.	9 16 35 W.	2 30
Reſolution (Iſle)	America	Hudſon's Straits	61 29 0 N.	65 16 0 W.	4 21 4 W.	
Reſolution (Iſle)	America	Pacific Ocean	17 23 30 S.	141 45 0 W.	9 27 0 W.	
Reſolution (Port)	Aſia	Tanna	19 32 25 S.	169 41 5 E.	11 18 44 E.	
Revel	Europe	Livonia	59 26 22 N.	24 39 15 E.	1 38 37 E.	
Rhe (Lights)	Europe	France	46 14 49 N.	1 33 40 W.	0 6 15 W.	3 0
Rheims	Europe	France	49 15 16 N.	4 1 48 E.	0 16 7 E.	
Rhodes	Europe	France	44 21 0 N.	2 34 17 E.	0 10 17 E.	
Riche (Point)	America	Newfoundland	50 40 10 N.	57 23 0 W.	3 49 32 W.	
Richmond (Obſer.)	Europe	England	51 28 8 N.	0 18 42 W.	0 1 15 W.	
Rieux	Europe	France	43 15 23 N.	1 12 0 E.	0 4 48 E.	
Riez	Europe	France	43 48 57 N.	6 5 6 E.	0 24 20 E.	
Riga	Europe	Livonia	56 56 24 N.	24 0 15 E.	1 36 1 E.	
Rimini	Europe	Italy	44 3 43 N.	12 32 36 E.	0 50 10 E.	
Ringſted	Europe	Denmark	55 26 51 N.	11 47 55 E.	0 47 12 E.	
Ringwood	Europe	England	50 50 58 N.	1 47 16 W.	0 7 9 W.	
Rio Janeiro	America	Braſil	22 54 10 N.	43 10 45 W.	2 52 43 W.	2 5
Ripa Trauſone	Europe	Italy	43 0 24 N.	13 44 30 E.	0 54 58 E.	
Rochelle	Europe	France	46 9 33 N.	1 9 2 W.	0 4 36 W.	3 45
Rochfort	Europe	France	45 56 10 N.	0 57 49 W.	0 3 51 W.	4 15
Rodoſto	Europe	Turkey	40 58 24 N.	27 25 16 E.	1 49 41 E.	
Rodrigues (Iſle)	Africa	Indian Ocean	19 40 40 S.	63 9 15 E.	4 12 37 E.	
Roeſkilde	Europe	Denmark	55 38 25 N.	12 5 27 E.	0 48 22 E.	
Romaine Key	America	Bahama Channel	22 1 30 N.	77 39 45 W.	5 10 39 W.	
Rome (St. Peter's)	Europe	Italy	41 53 54 N.	12 27 41 E.	0 49 51 E.	
Romney (New)	Europe	England	50 59 7 N.	0 56 22 E.	0 3 45 E.	
Romney (Old)	Europe	England	50 59 25 N.	0 53 50 E.	0 3 35 E.	
Ronde (Pulo)	Aſia	Straits of Malacca	- - -	95 13 0 E.	6 20 52 E.	
Rot (Abbey)	Europe	Bavaria	47 59 11 N.	12 3 30 E.	0 48 14 E.	
Rotterdam	Europe	Holland	51 56 0 N.	4 29 0 E.	0 17 56 E.	3 0
Rotterdam (Iſle)	Aſia	Friendly Iſles	20 15 22 S.	174 44 48 E.	11 38 59 E.	6 0
Rouen	Europe	France	49 26 27 N.	1 5 30 E.	0 4 22 E.	1 15
Round Iſland	America	Beering's Straits	58 56 30 N.	159 53 30 W.	10 39 34 W.	
Roxant (Cape)	Europe	Portugal	38 45 26 N.	9 35 50 W.	0 38 23 W.	
Royan	Europe	France	45 37 28 N.	1 1 32 W.	0 4 6 W.	

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Ruttunpour	Aſia	Berar	22 16 0 N.	82 36 0 E.	5 30 24 E.	
Rypen	Europe	Denmark	55 19 57 N.	8 47 5 E.	0 35 8 E.	
Saba (Iſle)	America	Caribbean Sea	17 39 30 N.	63 17 15 W.	4 13 9 W.	
Sable (Cape)	America	Nova Scotia	43 23 43 N.	65 39 15 W.	4 22 37 W.	
Sacrifice (Rocks)	Aſia	Malabar Coaſt	11 28 0 N.	75 31 5 E.	5 2 4 E.	
Saddle-back (Iſles)	America	Hudſon's Straits	62 7 0 N.	68 13 0 W.	4 32 52 W.	
Saeby	Europe	Denmark	57 20 2 N.	10 32 54 E.	0 42 12 E.	
Sagan	Europe	Silefia	51 42 12 N.	15 22 15 E.	1 1 29 E.	
Saintes	Europe	France	45 44 46 N.	0 37 45 W.	0 2 31 W.	
Saintes (Rocks) W. end.	Europe	Bay of Biſcay	48 5 5 N.	5 5 0 W.	0 20 20 W.	
Sainte-Croix	Europe	France	48 0 35 N.	7 23 55 E.	0 29 36 E.	
Salatan (Point)	Aſia	Borneo	4 13 45 S.	114 29 0 E.	7 37 56 E.	
Salee (New)	Africa	Morocco	34 5 0 N.	6 43 30 W.	0 26 54 W.	
Saliſbury	Europe	England	51 3 49 N.	1 47 0 W.	0 7 8 W.	
Saliſbury (Iſle)	America	Hudſon's Bay	63 29 0 N.	76 47 0 W.	5 7 8 W.	
Sall (Iſle)	Africa	Atlantic Ocean	16 38 15 N.	22 56 15 W.	1 31 45 W.	
Salonica	Europe	Turkey	40 41 10 N.	23 8 0 E.	1 32 32 E.	
Salvages (Iſles)	Africa	Atlantic Ocean	30 3 27 N.	16 6 30 W.	1 4 26 W.	
Samana	America	Hiſpaniola	19 15 40 N.	69 16 30 W.	4 37 6 W.	
Samara	Europe	Ruſſia	48 39 35 N.	35 20 0 E.	2 21 20 E.	
Sambelong (Great)	Aſia	Bengal Bay	7 10 0 N.	93 40 0 E.	6 14 40 E.	
Samganooda	America	Oonalaſka	53 54 29 N.	166 22 15 W.	11 5 29 W.	
Sancta Cruz	Africa	Teneriffe	28 29 4 N.	16 22 30 W.	1 5 30 W.	
Sancta Cruz	Africa	Grand Canary	28 10 37 N.	15 47 0 W.	1 3 8 W.	
Sandown Caſtle	Europe	England	51 14 18 N.	1 23 59 E.	0 5 36 E.	
Sandſoe	Europe	Lapland	68 56 15 N.	16 57 0 E.	1 7 48 E.	
Sandwich	Europe	England	51 16 30 N.	1 20 15 E.	0 5 21 E.	
Sandwich Bay	America	South Georgia	54 42 0 S.	36 12 0 W.	2 24 48 W.	
Sandwich (Cape)	Aſia	New Holland	18 17 11 S.	146 1 13 E.	9 44 5 E.	
Sandwich (Cape)	Aſia	Mallicola	16 28 0 S.	167 59 0 E.	11 11 56 E.	
Sandwich Harbour	Aſia	Mallicola	16 25 20 S.	167 53 0 E.	11 11 32 E.	
Sandwich Iſle	Aſia	New Hebrides	17 41 0 S.	168 33 0 E.	11 14 12 E.	
Sandy Bay	America	Nova Scotia	43 31 9 S.	65 39 15 W.	4 22 37 W.	
Sandy Cape	Aſia	New Holland	24 45 48 S.	153 12 22 E.	10 12 49 E.	
Sandy-Hook Lights	America	New Jerſey	44 26 30 N.	74 6 42 W.	4 56 27 W.	
Sapata (Pulo)	Aſia	Chineſe Sea	10 2 40 N.	109 12 51 E.	7 16 51 E.	
Saratow	Europe	Ruſſia	51 31 28 N.	46 0 0 E.	3 4 0 E.	
Sarlat	Europe	France	44 53 20 N.	1 12 49 E.	0 4 51 E.	
Sarum (Old)	Europe	England	51 5 45 N.	1 47 28 W.	0 7 10 W.	
Saunder's (Cape)	Aſia	New Zeeland	45 57 45 S.	170 16 0 E.	11 21 4 E.	
Saunder's (Cape)	America	South Georgia	54 6 30 S.	36 57 30 W.	2 27 50 W.	
Saunder's Iſle	America	Sandwich Land	58 0 0 S.	26 58 0 W.	1 47 52 W.	
Savage Iſle	Aſia	Pacific Ocean	19 2 15 S.	169 30 30 W.	11 18 2 W.	
Savanna (Lights)	America	Georgia	32 0 45 N.	80 56 0 W.	5 23 44 W.	
Schwezingen	Europe	Germany	49 23 4 N.	8 26 15 E.	0 33 45 E.	
Scilly Lights	Europe	St. Geo. Chan.	49 53 47 N.	6 29 30 W.	0 25 58 W.	
Scolt Head	Europe	England	52 59 40 N.	0 44 11 E.	0 2 57 W.	6 20
Sebaſtian (Cape St.)	Africa	Madagaſcar	12 30 0 S.	46 25 0 E.	3 5 40 E.	
Sedan	Europe	France	49 42 29 N.	4 57 36 E.	0 19 50 E.	
Seez	Europe	France	48 36 23 N.	0 10 44 E.	0 0 43 E.	

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Selinginſk	Aſia	Siberia	51 6 6 N.	106 40 45 E.	7 6 43 E.	
Selſea	Europe	England	50 43 50 N.	0 47 54 W.	0 3 12 W.	
Senegal	Africa	Negroland	15 53 0 N.	16 31 30 W.	1 6 6 W.	10 30
Senez	Europe	France	43 54 40 N.	6 24 5 E.	0 25 36 E.	
Senlis	Europe	France	49 12 28 N.	2 35 0 E.	0 10 20 E.	
Senones	Europe	France	48 23 7 N.	6 57 30 E.	0 27 50 E.	
Sens	Europe	France	48 11 56 N.	3 17 21 E.	0 13 9 E.	
Serdze Kamen	Aſia	Beering's Straits	67 3 0 N.	171 54 30 W.	11 27 38 W.	
Seringapatam	Aſia	Myſore	12 31 45 N.	76 46 45 E.	5 7 7 E.	
Seven Iſlands	Aſia	Chineſe Sea	1 5 16 S.	105 24 4 E.	7 1 36 E.	
Severndroog	Aſia	India	17 47 30 N.	73 9 0 E.	4 52 36 E.	
Sevaſtopolis	Europe	Crimea	44 41 30 N.	33 35 0 E.	2 14 20 E.	
Seychelles (Iſle)	Aſia	Almirantes	4 35 0 S.	55 35 0 E.	3 42 20 E.	5 30
Shepherd's Iſles	Aſia	New Hebrides	16 58 0 S.	168 42 0 E.	11 14 28 E.	
Shirburn Caſtle	Europe	England	51 39 22 N.	0 58 15 W.	0 3 53 W.	
Shoalneſs	America	Beering's Straits	59 37 0 N.	162 18 30 W.	10 49 14 W.	
Shoreham	Europe	England	50 50 7 N.	0 16 19 W.	0 1 5 W.	9 30
Siam	Aſia	India	14 18 0 N.	100 50 0 E.	6 43 20 E.	
Siao Iſle	Aſia	Chineſe Sea	2 49 0 N.	125 3 45 E.	8 20 15 E.	
Sidney Cove	Aſia	Port Jackſon	33 51 7 S.	151 13 30 E.	10 4 54 E.	
Sienna	Europe	Italy	43 22 0 N.	11 10 0 E.	0 44 40 E.	
Sierra Leone (Cape)	Africa	Sierra Leone	8 29 30 N.	13 9 17 W.	0 52 37 W.	
Sifran	Europe	Ruſſia	53 9 53 N.	48 24 45 E.	3 13 39 E.	
Si-nghan-fu	Aſia	China	34 16 30 N.	108 43 45 E.	7 14 55 E.	
Sinigaglia	Europe	Italy	43 43 16 N.	13 11 30 E.	0 52 46 E.	
Siſteron	Europe	France	44 11 51 N.	5 56 18 E.	0 23 45 E.	
Skagen (Lights)	Europe	Denmark	57 43 44 N.	10 37 45 E.	0 42 31 E.	
Skirmiſh Bay	Aſia	Chatham Iſland	43 49 3 S.	176 35 0 E.	11 46 20 E.	
Sledge Iſland	America	Beering's Straits	64 30 0 N.	166 8 0 E.	11 4 32 E.	
Sluys	Europe	Holland	51 18 35 N.	3 22 54 E.	0 13 32 E.	
Smeinogorſk	Aſia	Siberia	51 9 27 N.	82 8 0 E.	5 28 32 E.	
Smokey Cape	Aſia	New Holland	30 54 18 S.	153 1 40 E.	10 12 7 E.	
Smyrna	Aſia	Natolia	38 28 7 N.	27 6 33 E.	1 48 26 E.	
Snœfell (Mount)	Europe	Iceland	64 52 20 N.	23 54 0 W.	1 35 36 W.	
Socono (Iſle)	America	Pacific Ocean	18 48 0 N.	110 10 0 W.	7 20 40 W.	
Soiſſons	Europe	France	49 22 52 N.	3 19 16 E.	0 13 17 E.	
Sombavera (Iſles)	America	Caribbean Sea	18 38 0 N.	63 37 30 W.	4 14 30 W.	
Sonderburg	Europe	Denmark	54 54 59 N.	9 48 10 E.	0 39 13 E.	
Soolo	Aſia	Philippines	5 57 0 N.	121 15 30 E.	8 5 2 E.	
Southampton	Europe	England	50 54 0 N.	1 23 56 W.	0 5 36 W.	
South Cape	Aſia	New Zeeland	47 16 50 S.	167 20 9 E.	11 9 21 E.	
South Cape	Aſia	New Holland	43 42 30 S.	146 58 0 E.	9 47 52 E.	
South Iſland	Aſia	Chineſe Sea	24 22 30 N.	141 24 0 E.	9 25 36 E.	
Southern Thule	America	Sandwich Land	59 34 0 S.	27 45 0 W.	1 51 0 W.	
Spartel (Cape)	Africa	Morocco	35 46 0 N.	5 57 12 W.	0 23 49 W.	
Speaker Bank	Aſia	Indian Ocean	4 45 0 S.	72 57 0 E.	4 51 48 E.	
Spichel (Cape)	Europe	Portugal	38 22 15 N.	9 20 12 W.	0 37 21 W.	
Spring-Grove	Europe	England	51 28 34 N.	10 20 21 W.	0 1 21 W.	
Sproe (Iſle)	Europe	Great Belt	55 19 56 N.	10 56 45 E.	0 43 47 E.	
Stade	Europe	Germany	53 36 5 N.	9 23 15 E.	0 37 33 E.	
Stalbridge	Europe	England	50 57 0 N.	2 23 30 W.	0 9 34 W.	

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Start point	Europe	England	50 14 20 N.	3 44 30 W.	0 14 58 W.	
Stephen's (Cape)	Aſia	New Zeeland	40 36 50 S.	173 58 30 E.	11 35 54 E.	
Stephen's (Cape)	Aſia	Beering's Straits	63 33 30 N.	162 17 0 W.	10 49 8 W.	
Stephen's (Iſle)	Aſia	Cook's Straits	40 35 26 S.	174 0 22 E.	11 36 1 E.	
Stephen's (Port)	Aſia	New Holland	32 45 0 S.	152 12 0 E.	10 8 48 E.	
Stickhuſen	Europe	Germany	53 13 33 N.	7 40 6 E.	0 30 40 E.	
Stockholm	Europe	Sweden	59 20 31 N.	18 3 51 E.	1 12 15 E.	
Strabane	Europe	Ireland	54 49 29 N.	7 23 5 W.	0 29 32 W.	
Straſburg	Europe	France	48 34 56 N.	7 44 36 E.	0 30 58 E.	
Straumneſs	Europe	Iceland	65 39 40 N.	24 29 15 W.	1 37 57 W.	
Streatham	Europe	England	51 25 46 N.	0 7 47 W.	0 0 31 W.	
Stromnes	Europe	Orkneys	58 56 22 N.	3 31 15 W.	0 14 5 W.	9 0
Succeſs Bay	America	Terra del Fuego	54 49 45 S.	65 25 0 W.	4 21 40 W.	
Succeſs (Cape)	America	Terra del Fuego	55 1 0 S.	65 27 0 W.	4 21 48 W.	
Suez	Africa	Egypt	30 2 0 N.	32 28 30 E.	2 9 54 E.	
Sulphur Iſland	Aſia	Pacific Ocean	24 48 0 N.	141 20 0 E.	9 25 20 E.	
Surat	Aſia	India	21 11 0 N.	73 2 34 E.	4 52 10 E.	
Swilly Iſland	Aſia	New Holland	43 55 30 S.	147 7 30 E.	9 48 30 E.	
Swinfield	Europe	England	51 8 48 N.	1 11 15 E.	0 4 45 E.	
Table Cape	Aſia	New Zeeland	39 6 40 S.	178 2 20 E.	11 52 9 E.	
Table Iſland	Aſia	New Hebrides	15 38 0 S.	167 7 0 E.	11 8 28 E.	
Tackararee Point	Africa	Gold Coaſt	4 46 53 N.	2 27 44 W.	0 9 51 W.	
Taganrok	Aſia	Tartary	47 12 40 N.	38 38 45 E.	2 34 35 E.	
Tahoora	America	Sandwich Iſles	21 42 30 N.	160 24 30 W.	10 41 38 W.	
Tahowrooa	America	Sandwich Iſles	20 38 0 N.	156 36 30 W.	10 26 26 W.	
Tambou	Europe	Ruſſia	52 43 44 N.	41 45 0 E.	2 47 0 E.	
Tanjore	Aſia	India	10 46 30 N.	79 48 26 E.	5 19 14 E.	
Tanna	Aſia	New Hebrides	19 32 25 S.	169 41 5 E.	11 18 44 E.	3 0
Taoukaa Iſle	America	Pacific Ocean	14 30 30 S.	145 9 30 W.	9 40 38 W.	
Tarapia	Europe	Turkey	41 8 24 N.	29 0 28 E.	1 56 2 E.	
Taraſcon	Europe	France	43 48 20 N.	4 39 36 E.	0 18 38 E.	
Tarbes	Europe	France	43 13 52 N.	0 3 59 E.	0 0 16 E.	
Taſman's Head	Aſia	New Holland	43 33 30 S.	147 30 30 E.	9 50 2 E.	
Taſſa (Iſle)	Europe	Sea of Marmara	40 46 40 N.	24 38 54 E.	1 38 36 E.	
Taſſacorta	Africa	Palma Iſle	28 38 0 N.	17 58 0 W.	1 11 52 W.	
Taya (Pulo)	Aſia	Chineſe Sea	0 44 30 S.	106 3 15 E.	7 4 13 E.	
Tellicherry	Aſia	Malabar Coaſt	11 45 20 N.	75 29 3 E.	5 1 56 E.	
Temontengis	Aſia	Soloo	5 57 0 N.	120 53 30 E.	8 3 54 E.	
Teneriffe (Peake)	Africa	Canaries	28 15 38 N.	16 45 33 W.	1 7 2 W.	
Tenterden	Europe	England	51 4 8 N.	0 41 8 E.	0 2 45 E.	
Tercera	Europe	Azores	38 39 7 N.	27 12 42 W.	1 48 51 W.	
Terracina	Europe	Italy	41 18 14 N.	13 13 7 E.	0 52 52 E.	
St. Thadæus-Noſs	Aſia	Kamtchatka	62 50 0 N.	179 5 0 E.	11 56 20 E.	
Thalpeny Iſle	Aſia	Lacca- N.P.	10 10 30 N.	73 49 30 E.	4 55 18 E.	
		dives S.P.	10 4 0 N.	73 48 0 E.	4 55 12 E.	
Thionville	Europe	France	49 21 30 N.	6 10 30 E.	0 24 42 E.	
St. Thomas's Iſle	America	Virgin Iſles	18 21 55 N.	64 51 30 W.	4 19 26 W.	
St. Thomas's Iſle	Africa	Atlantic Ocean	0 19 0 N.	6 42 30 E.	0 26 50 E.	
Thorley Hall	Europe	England	51 50 45 N.	0 9 0 E.	0 0 36 E.	
Three Hill Iſland	Aſia	New Hebrides	17 4 0 S.	168 35 0 E.	11 14 20 E.	

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Three Kings Iſle	Aſia	New Zeeland	34 10 15 S.	172 25 8 E.	11 29 41 E.	
Three Points (Cape)	Africa	Gold Goaſt	4 40 30 N.	2 43 32 W.	0 10 54 W.	
Thrumb Cap	America	Pacific Ocean	18 36 41 S.	139 13 45 W.	9 16 55 W.	
Thule (Southern)	America	Sandwich Land	59 34 0 S.	27 45 0 W.	1 51 0 W.	
Thury	Europe	France	49 21 28 N.	2 18 30 E.	0 9 14 E.	
Tiburon (Cape)	America	Hiſpaniola	18 19 25 N.	74 34 12 W.	4 58 17 W.	
Timoam (Pulo)	Aſia	Gulf of Siam	2 53 30 N.	104 24 37 E.	6 57 38 E.	
Timor (S.W. Point)	Aſia	India	10 6 52 S.	124 4 36 E.	8 16 18 E.	
Timor-Land	Aſia	India	8 3 0 S.	132 17 0 E.	8 49 8 E.	
Tinian (Iſle)	Aſia	Pacific Ocean	15 0 0 N.	145 55 30 E.	9 43 42 E.	
Tobolſki	Aſia	Siberia	58 12 18 N.	68 18 30 E.	4 33 14 E.	
Tolaga Bay	Aſia	New Zeeland	38 22 0 S.	178 35 54 E.	11 54 24 E.	
Toledo	Europe	Spain	39 50 0 N.	3 20 0 W.	0 13 20 W.	
Tomſk	Aſia	Siberia	56 29 58 N.	84 58 30 E.	5 39 54 E.	
Tondern	Europe	Denmark	54 56 19 N.	8 53 17 E.	0 35 33 E.	
Tonga-Tabu (Iſle)	Aſia	Pacific Ocean	21 8 36 S.	175 1 50 E.	11 40 7 E.	6 50
Tongres	Europe	Netherlands	50 47 7 N.	5 27 23 E.	0 21 50 E.	
Tonnerre	Europe	France	47 51 8 N.	3 58 44 E.	0 15 55 E.	
Toobonai (Iſle)	America	Pacific Ocean	23 25 0 S.	149 20 30 W.	9 57 22 W.	
Tornea	Europe	Sweden	65 50 50 N.	24 14 0 E.	1 36 56 E.	
Tortudas	America	Weſt Indies E.P.	20 0 55 N.	72 42 35 W.	4 50 50 W.	
		W.P.	20 5 20 N.	73 1 26 W.	4 52 6 W.	
Toul	Europe	France	48 40 32 N.	5 53 18 E.	0 23 33 E.	
Toulon	Europe	France	43 7 16 N.	5 55 26 E.	0 23 42 E.	
Toulouſe	Europe	France	43 35 46 N.	1 26 45 E.	0 5 47 E.	
Tournai	Europe	Netherlands	50 36 57 N.	3 33 17 E.	0 13 33 E.	
Tours	Europe	France	47 23 46 N.	0 41 32 E.	0 2 46 E.	
Trafalgar	Europe	Spain	36 7 56 N.	6 3 0 W.	0 24 45 W.	
Traitor's Head	Aſia	Erramanga	18 43 30 S.	169 20 30 E.	11 17 22 E.	
Tranquebar	Aſia	India	10 56 0 S.	79 40 30 E.	5 18 42 E.	
Treguier	Europe	France	48 46 54 N.	3 13 49 W.	0 12 55 W.	
Treves	Europe	Germany	49 46 37 N.	6 38 5 E.	0 26 32 E.	
Trinidada	America	Cuba	21 47 45 N.	80 19 36 W.	5 21 18 W.	
Trinidada (Iſle)	America	Atlantic Ocean	20 30 30 S.	29 33 0 W.	1 58 12 W.	
Trinity Iſland	America	Pacific Ocean	56 35 0 N.	154 53 0 W.	10 19 32 W.	
Trinkamaly	Aſia	Ceylon	8 32 0 N.	81 12 0 E.	5 24 48 E.	
Tripoli	Africa	Barbary	32 53 40 N.	13 21 7 E.	0 53 24 E.	
Tritchinopoly	Aſia	India	10 49 0 N.	78 38 26 E.	5 14 34 E.	
Tropez (St.)	Europe	France	43 16 8 N.	6 38 29 E.	0 26 34 E.	
Troyes	Europe	France	48 18 5 N.	4 4 34 E.	0 16 18 E.	
Tſcherkaſki	Europe	Ruſſia	47 13 40 N.	39 45 0 E.	2 39 0 E.	
Tſchukotſkoi	Aſia	Beering's Straits	64 14 30 N.	173 31 0 W.	11 34 4 W.	
Tubingen	Europe	Germany	48 31 4 N.	9 2 29 E.	0 36 10 E.	
Tulles	Europe	France	45 16 3 N.	1 46 2 E.	0 7 4 E.	
Turin	Europe	Italy	45 4 14 N.	7 40 0 E.	0 30 40 E.	
Turnagain (Cape)	Aſia	New Zeeland	40 32 30 S.	176 49 0 E.	11 47 16 E.	
Turk's Iſles	America	Windw. Paſſage	21 11 0 N.	71 15 22 E.	4 45 1 W.	
Turtle Iſland	Aſia	Pacific Ocean	19 48 45 S.	177 57 0 W.	11 51 48 W.	
Two Groups	America	Pacific Ocean	18 12 36 S.	142 11 45 W.	9 28 47 W.	
Typa	Aſia	China	22 9 20 N.	113 43 45 E.	7 34 55 E.	
Tyrnaw	Europe	Hungary	48 23 30 N.	17 34 36 E.	1 10 18 E.	

A Table of the Latitudes and Longitudes of Places.

Names of Places.	Continents.	Coaſt, Sea, or Country.	Latitude.	Longitude In Degrees.	Longitude In Time.	H. W.
			° ′ ″	° ′ ″	H. M. S.	H M.
Ubes (St.)	Europe	Portugal	38 22 15 N.	8 54 22 W.	0 35 37 W.	
Ufa	Europe	Ruſſia	54 42 45 N.	55 53 30 E.	3 43 34 E.	
Uliateah	America	Pacific Ocean	16 45 0 S.	151 31 0 W.	10 6 4 W.	
Ulm	Europe	Germany	48 23 45 N.	9 58 51 E.	0 39 55 E.	
Umba	Europe	Lapland	66 39 48 N.	34 14 45 E.	2 16 59 E.	
Unſt	Europe	Shetland	60 44 0 N.	0 46 0 W.	0 3 4 W.	
Upſal	Europe	Sweden	59 51 50 N.	17 38 9 E.	1 10 33 E.	
Uralſk	Aſia	Tartary	51 11 0 N.	51 35 15 E.	3 36 24 E.	
Uraniberg	Europe	Denmark	55 54 17 N.	12 53 0 E.	0 50 51 E.	
Urbine	Europe	Italy	43 43 36 N.	12 36 50 E.	0 50 27 E.	
Uſhant Lights	Europe	France	48 28 8 N.	5 3 21 W.	0 20 13 W.	
Uſolic (Novo)	Europe	Ruſſia	59 23 54 N.	56 32 15 E.	3 46 9 E.	
Uſt-kamenogorſk	Aſia	Siberia	49 56 49 N.	82 38 30 E.	5 30 34 E.	
Utrecht	Europe	Netherlands	52 5 0 N.	5 9 45 E.	0 20 39 E.	
Uzes	Europe	France	44 0 45 N.	4 25 2 E.	0 17 40 E.	
Vabres	Europe	France	43 56 27 N.	2 50 16 E.	0 11 21 E.	
Vaiſon	Europe	France	44 14 28 N.	5 3 54 E.	0 20 16 E.	
Valence	Europe	France	44 55 59 N.	4 53 10 E.	0 19 33 E.	
Valenciennes	Europe	France	50 21 27 N.	3 31 40 E.	0 14 7 E.	
Valery (St.) ſur Som	Europe	France	50 11 21 N.	1 37 36 E.	0 6 30 E.	10 0
Valery (St.) en Caup	Europe	France	49 52 12 N.	0 41 10 E.	0 2 45 E.	9 45
Valparaiſo	America	Chili	33 1 29 S.	72 19 15 W.	4 49 17 W.	
Van Dieman's Road	Aſia	Tonga-Tabu	21 4 15 S.	175 6 0 W.	11 40 24 W.	7 15
Vannes	Europe	France	47 39 26 N.	2 45 19 W.	0 11 1 W.	3 45
Vauxe's Tomb	Aſia	India	21 4 30 N.	72 48 44 E.	4 51 15 E.	
Vence	Europe	France	43 43 13 N.	7 6 29 E.	0 28 26 E.	
Venice	Europe	Italy	45 27 4 N.	12 3 15 E.	0 48 13 E.	
Venus (Point)	America	Otaheite	17 29 15 S.	149 30 22 W.	9 58 1 W.	10 38
Vera Cruz	America	Mexico	19 9 36 N.	95 3 0 W.	6 20 12 W.	
Verd (Cape)	Africa	Negroland	14 47 13 N.	17 33 16 W.	1 10 13 W.	
Verdun	Europe	France	49 9 24 N.	5 22 41 E.	0 21 31 E.	
Verona	Europe	Italy	45 26 26 N.	11 1 0 E.	0 44 4 E.	
Verſailles	Europe	France	48 48 21 N.	2 7 7 E.	0 8 28 E.	
Victoria (Fort)	Aſia	Malabar Coaſt	17 56 40 N.	73 7 54 E.	4 52 32 E.	
Vienna (Obſervatory)	Europe	Germany	48 12 36 N.	16 21 54 E.	1 5 28 E.	
Vigo	Europe	Spain	42 13 20 N.	8 27 45 W.	0 33 51 W.	
Villa Franca	Europe	Italy	43 40 20 N.	7 19 15 E.	0 29 17 E.	
St. Vincent's (Cape)	Europe	Portugal	37 1 0 N.	9 2 22 W.	0 36 9 W.	
St. Vincent's (Iſle)	America	Caribbean Sea	13 10 15 N.	61 30 51 W.	4 6 3 W.	
Vingorla Rocks	Aſia	Malabar Coaſt	15 55 30 N.	73 30 0 E.	4 54 0 E.	
Vintimiglia	Europe	Italy	43 53 20 N.	7 37 30 E.	0 30 30 E.	
Virgin-Gorda (Fort)	America	Weſt Indies	18 18 0 N.	64 18 40 W.	4 17 15 W.	
Virgin (Cape)	America	Patagonia	52 23 0 S.	67 54 0 W.	4 31 36 W.	10 0
Viſagapatam	Aſia	India	17 42 0 N.	83 23 52 E.	5 33 35 E.	
Viviers	Europe	France	44 28 57 N.	4 40 45 E.	0 18 43 E.	
Wakefield	Europe	England	53 41 0 N.	1 35 0 W.	0 6 20 W.	
Wales (P. of) Cape	America	Beering's Straits	65 45 30 N.	168 17 30 W.	11 13 10 W.	
Wales (P. of) Fort	America	New Wales	58 47 32 N.	94 13 48 W.	6 16 55 W.	7 20
Wales (P. of) Iſles	America	Pacific Ocean	14 58 0 S.	147 48 0 W.	9 51 12 W.	

A TABLE of the Latitudes and Longitudes of Places.

Names of Places.	Continents.	Coaſt, Sea, or Country.	Latitude.	Longitude		H. W.
				In Degrees.	In Time.	
			° ′ ″	° ′ ″	H. M. S.	H. M.
Wallis's Iſle	Aſia	Pacific Ocean	13 17 0 S.	176 45 0 W.	11 47 0 W.	
Walviſch Bay	Africa	Caffraria	22 54 51 S.	14 40 0 E.	0 58 40 E.	
Wanſtead	Europe	England	51 34 20 N.	0 2 30 E.	0 0 10 E.	
Waraſden	Europe	Hungary	46 18 18 N.	16 25 51 E.	1 5 43 E.	
Wardhus	Europe	Lapland	70 22 36 N.	31 6 0 E.	2 4 24 E.	
Warſaw	Europe	Poland	52 14 28 N.	21 1 5 E.	1 24 4 E.	
Warwick (Cape)	America	Hudſon's Straits	61 29 0 N.	65 16 0 W.	4 21 4 W.	
Wateoo	America	Pacific Ocean	20 1 30 S.	158 14 30 W.	10 32 58 W.	
Watling's Iſle (W. P.)	America	Bahamas	23 56 0 N.	74 42 32 W.	4 58 50 W.	
Weſt Cape	Aſia	New Zeeland	45 56 15 S.	166 6 15 E.	11 4 25 E.	
Weſtman (Iſles)	Europe	Northern Ocean	63 20 30 N.	20 27 45 E.	1 21 51 E.	
Whitſunday Cape	America	Cook's River	58 15 0 N.	152 36 0 W.	10 10 24 W.	
Whitſun Iſland	America	Pacific Ocean	19 26 0 S.	138 12 0 W.	9 12 48 W.	
Whitſuntide Iſle	Aſia	Pacific Ocean	15 44 20 S.	168 20 15 E.	11 13 21 E.	
Whytootachee	America	Pacific Ocean	18 51 40 S.	159 39 45 W.	10 38 39 W.	
Wiborg	Europe	North Jutland	57 27 11 N.	9 26 15 E.	0 37 45 W.	
Wicklow	Europe	Ireland	52 59 0 N.	6 1 0 W.	0 24 4 W.	7 30
Wildeſhauſen	Europe	Germany	52 54 26 N.	8 27 39 E.	0 33 51 E.	
William (Fort)	Aſia	Bengal	22 34 0 N.	88 27 56 E.	5 53 52 E.	
Willis's Iſle	America	St. Georgia	54 0 0 S.	38 29 40 W.	2 33 59 W.	
Wilna	Europe	Poland	54 41 0 N.	25 14 51 E.	1 40 59 W.	
Winchelſea	Europe	England	50 55 28 N.	0 42 31 E.	0 2 50 E.	
Windſor	Europe	England	51 29 0 N.	0 35 28 W.	0 2 22 W.	
Wittemburg	Europe	Germany	51 53 0 N.	12 42 45 E.	0 50 51 E.	
Woahoo (Iſle)	America	Sandwich Iſles	21 40 30 N.	158 1 30 W.	10 32 6 W.	
Wologda	Europe	Ruſſia	59 13 33 N.	40 10 0 E.	2 40 40 E.	
Wolſtenholme Cape	America	Hudſon's Straits	62 39 0 N.	77 48 0 W.	5 11 12 W.	
Woody Point	America	Pacific Ocean	50 0 30 N.	127 57 0 W.	8 31 44 W.	
Worceſter	Europe	England	52 9 30 N.	2 0 15 W.	0 8 1 W.	
Woroneſch	Europe	Ruſſia	51 40 30 N.	39 20 45 E.	2 37 23 E.	
Woſlak	Europe	Ruſſia	61 15 0 N.			
Wrotham	Europe	England	51 18 54 N.	0 19 12 E.	0 1 17 E.	
Wurtzburg	Europe	Germany	49 46 6 N.	9 54 45 E.	0 39 39 E.	
Xamhay	Aſia	China	31 16 0 N.	121 31 45 E.	8 6 7 E.	
Yeû (Iſle d')	Europe	France	46 42 26 N.	2 19 50 W.	0 9 19 W.	
Ylo	America	Peru	17 36 15 S.	71 13 0 W.	4 44 52 W.	
York	Europe	England	53 57 45 N.	1 6 4 W.	0 4 24 W.	
York Cape	Aſia	New Holland	10 38 20 S.	142 12 20 E.	9 28 49 E.	
York Fort	America	New Wales	57 1 48 N.	92 17 11 W.	6 9 9 W.	9 10
York (Duke of) Iſle	Aſia	Pacific Ocean	8 29 0 S.	172 22 0 W.	11 29 28 W.	
York Minſter	America	Terra del Fuego	55 26 20 S.	70 8 0 W.	4 40 32 W.	
York (New)	America	Jerſey	40 43 0 N.	74 9 0 W.	4 56 36 W.	9 0
Young (Cape)	Aſia	Chatham Iſland	43 48 0 N.	176 58 0 W.	11 47 52 W.	
Ypres	Europe	Netherlands	50 51 10 N.	2 52 49 E.	0 11 31 E.	
Zachu (Rocks)	America	Porto Rico	18 24 0 N.	67 45 30 W.	4 31 2 W.	
Zaricin	Europe	Ruſſia	48 42 20 N.	44 27 30 E.	2 57 50 E.	
Znaym	Europe	Germany	48 51 15 N.	16 1 42 E.	1 4 7 E.	

LONGITUDE.

A Catalogue of the Longitudes and Latitudes of Six Hundred fixed Stars, with the Angle of Poſition of each Star, adapted to the Beginning of 1800.

N. B. This Catalogue is taken from the Connoiſſance des Temps l'An. XII. and was calculated from the French Annual Catalogue, by M. Chabrol.

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variations.
	S. D. M. S.	D. M. S.	D. M. S.	S.
γ Pegaſi	0 6 22 9	12 35 47 N.	24 4 44	— 0.26
ι Ceti	11 28 7 10	10 1 13 S.	23 49 53	— 0.82
κ Caſſiopeæ	1 9 49 58	52 15 38 N.	40 21 56	— 4.01
ζ Caſſiopeæ	1 2 17 32	44 42 13 N.	33 49 37	— 3.73
ε Andromedæ	0 18 9 41	23 1 20 N.	25 25 55	— 2.77
δ Andromedæ	0 19 1 33	24 20 54 N.	25 42 2	— 2.87
α Caſſiopeæ	1 5 0 36	46 36 27 N.	35 5 40	— 4.49
β Ceti	11 29 46 3	20 46 54 S.	24 55 15	— 3.09
ζ Andromedæ	0 17 48 12	17 36 45 N.	24 21 26	— 3.48
η Caſſiopeæ	1 7 25 14	47 3 8 N.	35 13 39	— 5.88
δ Piſcium	0 11 21 9	2 10 30 N.	23 8 15	— 3.35
35 ν Andromedæ	0 26 22 15	32 32 58 N.	27 45 7	— 4.40
γ Caſſiopeæ	1 11 9 26	48 47 45 N.	36 22 15	— 7.68
37 μ Andromedæ	0 26 23 8	29 38 52 N.	26 41 13	— 4.99
Polaris	2 25 46 14	66 4 39 N.	73 2 22	— 147.57
ε Piſcium	0 14 44 11	1 4 57 N.	22 49 14	— 4.58
η Ceti	0 8 57 35	16 6 40 S.	23 38 36	— 5.15
β Andromedæ	0 27 37 5	25 56 52 N.	25 22 5	— 6.14
θ Caſſiopeæ	1 9 0 25	43 6 38 N.	31 50 9	— 8.68
ζ Piſcium	0 17 4 44	0 12 52 S.	22 31 38	— 5.49
46 Andromedæ	1 5 4 52	33 48 50 N.	27 10 27	— 8.51
δ Caſſiopeæ	1 15 8 12	46 23 34 N.	33 2 33	— 12.21
θ Ceti	0 13 26 12	15 45 58 S.	23 6 8	— 6.43
48 Andromedæ	1 6 0 2	33 18 9 N.	26 47 9	— 9.08
49 ξ Andromedæ	1 7 20 2	34 32 17 N.	27 6 3	— 9.63
η Piſcium	0 24 1 28	5 22 5 N.	22 2 48	— 7.13
π Piſcium	0 24 7 39	1 53 2 N.	21 44 18	— 7.52
ν Piſcium	0 22 42 49	4 42 19 S.	21 37 11	— 7.76
φ Andromedæ	1 11 48 48	36 49 58 N.	27 17 38	— 11.98
110 ο Piſcium	0 24 56 44	1 37 59 S.	21 23 30	— 8.13
52 τ Ceti	0 15 5 27	24 54 15 S.	23 42 17	— 8.41
ε Caſſiopeæ	1 21 59 9	47 31 37 N.	32 17 45	— 18.45
ζ Ceti	0 19 9 13	20 20 33 S.	22 33 32	— 8.75
α Tri. Bor.	1 4 4 47	16 47 52 N.	22 3 54	— 9.79
γ Arietis	1 0 23 35	7 9 26 N.	21 12 40	— 9.12
β Arietis	1 1 10 39	8 28 50 N.	21 13 59	— 9.29
50 f Caſſiopeæ	2 0 46 51	54 21 54 N.	37 38 54	— 28.21
γ Andromedæ	1 11 26 28	27 47 22 N.	23 26 10	— 12.48
α Piſcium	0 26 34 47	9 4 28 S.	20 52 22	— 9.38
α Arietis	1 4 51 58	9 57 42 N.	20 42 44	— 10.49
β Tri. Bor.	1 9 33 36	20 34 3 N.	21 44 39	— 11.86
γ Tri. Bor.	1 10 43 51	18 56 1 N.	21 4 1	— 12.41
ο Ceti	0 28 43 45	15 56 13 S.	20 29 13	— 10.72
35 δ Caſſiopeæ H.	1 29 27 1	48 57 21 N.	30 29 39	— 27.47
ρ Ceti	0 26 55 1	25 15 5 S.	21 23 20	— 11.51

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variations.
	S. D. M. S.	D. M. S.	D. M. S.	S.
ξ^2 Ceti	1 4 40 25	5 52 9 S.	19 17 26	— 11.40
σ Ceti	0 27 18 27	28 32 13 S.	21 30 43	— 12.1[illegible]
δ Ceti	1 4 46 27	14 28 30 S.	19 5 35	— [illegible]
ε Ceti	1 0 32 6	26 0 2 S.	20 35 11	— 12.48
θ Perſei	1 21 51 53	31 36 25 N.	21 43 37	— 19.40
35 Arietis	1 14 8 47	11 17 44 N.	18 40 44	— 13.79
γ Ceti	1 6 38 51	12 0 25 S.	18 38 56	— 12.[illegible]9
μ Ceti	1 9 7 56	5 34 40 S.	18 14 [illegible]	— 12.[illegible]3
ϖ^1 Ceti	1 0 57 17	28 15 37 S.	20 40 29	— 12.92
1 τ^1 Eridani	0 29 14 19	32 44 35 S.	21 37 10	— 13.32
39 Arietis	1 15 34 22	12 28 22 N.	18 28 35	— 14.52
η Perſei H.	1 25 55 6	37 27 34 N.	22 55 40	— 22.01
16 P^1 Perſei	1 19 2 25	20 55 58 N.	19 12 23	— 16.04
41 Arietis	1 15 21 47	10 26 19 N.	18 11 23	— 14.23
τ Perſei	1 25 7 41	34 21 6 N.	2 40 15	— 20.88
2 τ^2 Eridani	0 29 49 53	35 31 55 S.	21 50 49	— 14.00
21 Perſei	1 18 23 12	14 25 30 N.	17 59 36	— 15.43
22 ϖ Perſei	1 21 7 0	21 42 45 N.	18 43 22	— 17.03
η Eridani	1 5 56 6	24 32 58 S.	19 5 21	— 13.50
λ Ceti	1 12 17 57	7 48 10 S.	17 18 27	— 13.59
γ Perſei	1 27 14 17	34 30 30 N.	20 50 13	— 22.36
α Ceti	1 11 31 32	12 35 48 S.	17 22 28	— 13.66
25 ρ Perſei	1 22 7 7	20 33 40 N.	18 5 28	— 17.36
11 Eridani	1 1 42 52	38 57 40 S.	21 50 51	— 15.10
10 ρ Eridani	1 8 24 35	23 55 35 S.	18 23 7	— 13.95
β Perſei	1 23 22 51	22 24 22 N.	18 6 41	— 18.39
κ Perſei	1 25 0 40	26 2 17 N.	18 32 12	— 19.41
δ Arietis	1 18 3 9	1 48 26 N.	16 20 49	— 14.97
α Fornacis	1 1 45 25	44 43 51 S.	22 57 41	— 16.55
ζ Eridani	1 11 1 36	25 56 29 S.	17 44 13	— 14.73
α Perſei	1 29 17 39	30 6 19 N.	18 6 28	— 22.56
16 Eridani	1 7 17 55	38 31 23 S.	20 3 1	— 16.01
97 κ^2 Ceti	1 16 3 1	14 17 12 S.	16 3 55	— 14.81
2 Giraf. H.	2 3 47 44	39 30 25 N.	20 6 8	— 29.18
ο Tauri	1 18 22 26	9 21 1 S.	15 30 19	— 15.15
4 Giraf. H.	2 2 13 12	35 11 41 N.	18 45 22	— 26.05
2 ξ Tauri	1 19 6 57	8 48 54 S.	15 18 8	— 15.31
35 σ Perſei	1 29 49 17	28 1 20 N.	17 9 57	— 22.31
5 *f* Tauri	1 20 47 51	5 26 5 S.	14 55 29	— 15.68
17 Eridani	1 16 2 46	23 21 23 S.	16 7 43	— 15.45
37 ψ Perſei	2 0 57 29	27 56 56 N.	16 37 53	— 22.89
ε Eridani	1 15 25 54	27 45 2 S.	16 29 31	— 15.77
19 Eridani	1 11 23 48	39 27 17 S.	18 50 14	— 16.86
10 Tauri	1 19 10 37	18 25 48 S.	15 5 21	— 15.70
δ Perſei	2 2 0 51	27 16 53 N.	15 56 37	— 23.24
41 ν Perſei	2 1 2 10	22 7 45 N.	15 1 25	— 21.46
δ Eridani	1 18 3 15	28 44 15 S.	15 42 13	— 16.34
η Pleiadum	1 27 12 1	4 1 54 N.	13 36 8	— 17.63
26 ϖ Eridani	1 18 9 29	31 8 22 S.	15 48 11	— 16.63
27 Eridani	1 14 34 44	41 52 52 S.	18 3 57	— 17.82

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variations.
	S. D. M. S.	D. M. S.	D. M. S.	S.
ζ Perſei	2 0 19 59	11 18 37 N.	13 19 59	— 19.27
46	2 4 25 21	26 50 1 N.	14 40 37	— 24.28
g Eridani	1 8 56 56	54 19 28 S.	22 45 21	— 20.60
ε Perſei	2 2 53 18	19 5 33 N.	13 35 11	— 21.50
33 Eridani	1 16 3 28	43 39 56 S.	17 47 0	— 18.40
γ Eridani	1 21 3 50	33 12 55 S.	14 57 7	— 17.34
λ Tauri	1 27 50 28	7 58 55 S.	12 30 38	— 17.23
36 k Eridani	1 18 9 52	43 29 27 S.	16 58 58	— 18.63
47 λ Perſei	2 6 57 45	28 51 31 N.	13 58 4	— 26.27
38 ν Tauri	1 27 7 23	14 28 16 S.	12 32 27	— 17.07
A^1 Tauri	2 0 39 31	1 14 30 N.	12 6 29	— 18.28
51 μ Perſei	2 8 0 20	26 41 0 N.	12 50 59	— 25.86
ο Eridani	1 26 37 58	27 28 43 S.	12 45 30	— 17.56
49 μ Tauri	2 0 47 9	12 12 17 S.	11 19 47	— 17.72
γ Tauri	2 3 0 21	5 45 12 S.	10 47 30	— 18.32
41 Eridani	1 19 41 25	53 59 0 S.	18 10 5	— 21.50
δ^1 Tauri	2 4 4 20	3 59 25 S.	10 29 37	— 18.63
δ^2 Tauri	2 4 19 48	4 7 57 S.	10 23 25	— 18.66
42 ξ Eridani	2 0 30 55	25 0 3 S.	11 20 2	— 17.94
43 d Eridani	1 21 40 25	54 33 40 S.	17 26 0	— 21.84
ε Tauri	2 5 39 58	2 35 17 S.	9 58 37	— 19.03
Aldebaran	2 6 59 37	5 28 46 S.	9 19 19	— 19.04
47 Eridani	2 2 32 55	29 52 40 S.	10 42 12	— 18.51
50 υ^1 Eridani	1 25 52 7	52 52 52 S.	15 18 21	— 21.67
48 ν Eridani	2 4 0 59	25 8 49 S.	10 4 9	— 18.40
51 C. Eridani	2 4 30 57	24 19 29 S.	9 52 42	— 18.43
52 υ^2 Eridani	1 27 4 56	51 50 3 S.	14 37 8	— 21.47
53 Eridani	2 2 27 46	36 1 7 S.	10 58 20	— 19.08
54 Eridani	2 1 55 28	41 23 54 S.	11 30 31	— 19.74
9 Camelopardalis	2 18 11 18	43 23 28 N.	11 33 4	— 45.76
μ Eridani	2 6 32 22	25 23 27 S.	9 8 25	— 18.70
1 Orionis	2 9 6 13	15 24 14 S.	8 13 13	— 18.90
2 π^1 Orionis	2 9 34 18	13 30 21 S.	8 4 47	— 19.01
3 Orionis	2 9 18 20	16 47 45 S.	8 7 26	— 18.90
o^1 Orionis	2 10 41 56	8 14 56 S.	7 47 35	— 19.41
8 z Orionis	2 9 41 41	20 1 42 S.	7 56 54	— 18.93
3 ι Aurigæ	2 13 50 51	10 25 49 N.	7 34 34	— 22.52
9 o^2 Orionis	2 11 33 15	9 5 10 S.	7 26 8	— 19.46
10 Camelopardalis	2 18 28 38	37 24 18 N.	9 11 25	— 38.08
ε Aurigæ	2 16 3 0	20 55 3 N.	7 36 25	— 26.23
10 Orionis	2 10 44 34	20 52 31 S.	7 32 56	— 19.04
8 ζ Aurigæ	2 15 50 33	18 10 40 N.	7 23 20	— 25.15
102 ι Tauri	2 13 59 28	1 13 19 S.	6 46 8	— 20.51
139 Camelopardalis	2 19 43 43	39 20 36 N.	8 45 22	— 40.98
10 η Aurigæ	2 16 39 13	18 15 43 N.	6 59 25	— 25.35
ε Leporis	2 9 15 16	44 59 6 S.	8 47 29	— 20.87
β Eridani	2 12 29 20	27 52 55 S.	6 54 43	— 19.37
69 λ Eridani	2 12 25 8	31 34 3 S.	6 59 44	— 19 56
Capella	2 19 3 49	22 51 44 N.	6 13 7	— 27.77
5 μ Leporis	2 12 35 38	39 4 18 S.	7 8 5	— 20.24

LONGITUDE.

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variations.
	S. D. M. S.	D. M. S.	D. M. S.	S
Rigel - -	2 14 2 1	31 8 45 S.	6 21 28	— 19.65
20 τ Orionis - -	2 15 3 8	29 51 41 S.	5 56 26	— 19.64
β Tauri - -	2 19 46 54	5 22 14 N.	4 36 26	— 22.29
γ Orionis - -	2 18 9 11	16 50 27 S.	4 42 59	— 19.73
η Orionis - -	2 17 21 51	25 33 26 S.	5 0 9	— 19.63
β Leporis - -	2 16 52 37	43 56 6 S.	5 33 17	— 21.09
δ Orionis - -	2 19 34 6	23 34 43 S.	4 8 5	— 19.73
36 υ Orionis - -	2 19 7 3	30 34 4 S.	4 20 54	— 19.91
α Leporis - -	2 18 35 15	41 4 58 S.	4 45 6	— 20.78
39 λ Orionis - -	2 20 54 47	13 23 37 S.	3 39 33	— 20.06
ε Columbæ - -	2 15 54 19	58 39 0 S.	6 51 6	— 24.31
ι Orionis - -	2 20 12 9	29 13 25 S.	3 54 26	— 19.90
ζ Tauri - -	2 21 59 30	2 13 10 S.	3 24 25	— 21.19
ε Orionis - -	2 20 40 10	24 31 56 S.	3 42 10	— 19.80
125 Tauri - -	2 22 38 47	2 30 48 N.	3 14 40	— 22.00
48 σ Orionis - -	2 21 18 5	25 57 20 S.	3 27 24	— 19.85
ζ Orionis - -	2 21 53 21	25 19 9 S.	3 13 22	— 19.86
α Columbæ - -	2 19 22 41	57 23 55 S.	5 5 27	— 24.01
γ Leporis - -	2 22 5 25	45 49 28 S.	3 24 3	— 21.54
132 Tauri - -	2 24 42 37	1 7 42 N.	2 18 43	— 21.87
14 ζ Leporis - -	2 23 10 51	38 14 22 S.	2 48 16	— 20.61
κ Orionis - -	2 23 36 19	33 5 47 S.	2 34 45	— 20.11
δ Leporis - -	2 24 21 28	44 17 8 S.	2 24 7	— 21.36
δ Aurigæ - -	2 27 7 10	30 49 35 N.	1 57 46	— 34.15
β Columbæ - -	2 23 37 26	59 13 47 S.	3 7 39	— 24.63
α Orionis - -	2 25 57 38	16 3 7 S.	1 37 14	— 20.13
β Aurigæ - -	2 27 7 8	21 29 0 N.	1 37 10	— 28.19
θ Aurigæ - -	2 27 8 51	13 45 9 N.	1 25 31	— 25.07
16 η Leporis - -	2 26 6 42	37 38 12 S.	1 35 46	— 20.61
γ Columbæ - -	2 26 15 3	58 44 45 S.	1 49 43	— 24.50
61 μ Orionis - -	2 27 48 40	13 48 50 S.	0 53 2	— 20.28
1 H. Geminorum -	2 28 9 14	0 11 28 S.	0 48 0	— 21.77
ν Orionis - -	2 29 3 34	8 40 56 S.	0 23 14	— 20.69
θ Leporis - -	2 29 6 23	38 23 19 S.	0 22 6	— 20.71
2 Lyncis - -	3 0 18 36	35 35 45 N.	0 14 24	+ 38.92
η Geminorum - -	3 0 38 48	0 54 44 S.	0 16 44	+ 21 67
μ Geminorum - -	3 2 30 21	0 50 20 S.	1 4 50	+ 21.65
ζ Canis Major - -	3 4 35 28	53 23 57 S.	2 6 32	+ 23.07
ε Monocerotis - -	3 3 27 49	18 44 21 S.	1 22 59	+ 20.04
β Canis Major - -	3 4 23 58	41 16 46 S.	1 50 21	+ 20.98
δ Columbæ - -	3 5 38 34	56 44 12 S.	2 41 11	+ 23.90
ν Geminorum - -	3 4 0 34	3 4 52 S.	1 42 5	+ 21.28
13 Monocerotis -	3 5 41 31	15 53 18 S.	2 10 58	+ 20.09
γ Geminorum - -	3 6 18 35	6 45 46 S.	2 37 1	+ 20.74
42 Camelopardalis -	3 3 58 2	44 24 9 N.	4 10 30	+ 52.42
15 Monocerotis -	3 7 34 24	13 12 0 S.	3 3 20	+ 20.15
ε Geminorum - -	3 7 8 46	2 2 45 N.	3 8 29	+ 21.92
43 Camelopardalis -	3 4 5 19	45 44 31 N.	4 33 49	+ 55.53
2 ξ Geminorum - -	3 8 25 26	10 7 6 S.	3 26 1	+ 20.32
Sirius - -	3 11 19 32	39 33 38 S.	4 40 37	+ 20.60

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variations.
	S. D. M. S.	D. M. S.	D. M. S.	S.
18 Monocerotis	3 9 59 7	20 31 9 S.	3 57 48	+ 19.76
34 θ Geminorum	3 8 19 40	11 0 29 N.	3 59 53	+ 23.83
$\varkappa^2$ Canis Major	3 15 47 25	55 10 18 S.	7 21 51	+ 23.26
18 μ Canis Major	3 14 15 27	36 40 47 S.	5 47 45	+ 20.17
20 ι Canis Major	3 14 44 17	39 40 1 S.	6 4 28	+ 20.46
ε Canis Major	3 17 59 8	51 22 59 S.	8 3 32	+ 22.26
ζ Geminorum	3 12 11 51	2 3 49 S.	5 9 55	+ 20.86
b Canis Major	3 18 46 45	50 15 5 S.	8 19 18	+ 21.97
24 o^2 Canis Major	3 18 13 17	46 9 14 S.	7 48 25	+ 21.21
γ Canis Major	3 16 49 23	38 1 0 S.	6 51 50	+ 20.16
δ Canis Major	3 20 37 2	48 28 33 S.	8 58 54	+ 21.51
δ Geminorum	3 15 43 40	0 12 6 S.	6 42 6	+ 20.68
ι Geminorum	3 16 10 10	5 44 26 N.	7 13 39	+ 21.55
η Canis Major	3 26 45 44	50 37 50 S.	11 49 15	+ 21.61
β Canis Minor	3 19 24 18	13 30 25 S.	7 41 28	+ 19.13
Caſtor	3 17 27 17	10 4 53 N.	8 7 30	+ 22.18
69 υ Geminorum	3 18 33 2	5 11 59 N.	8 11 54	+ 21.04
Procyon	3 23 1 33	15 58 46 S.	9 0 22	+ 18.62
26 Monocerotis	3 26 30 5	30 28 13 S.	10 22 0	+ 18.66
κ Geminorum	3 20 52 25	3 3 31 N.	8 59 49	+ 20.29
Pollux	3 20 27 18	6 40 1 N.	9 6 39	+ 20.92
ξ Navis	4 3 16 5	44 57 30 S.	13 52 29	+ 19.87
9 Navis	4 0 33 50	34 9 30 S.	12 0 46	+ 18.54
11 *c* Navis	4 4 51 54	42 35 45 S.	14 14 55	+ 19.27
13 Navis	3 29 37 27	17 46 29 S.	11 18 27	+ 17.70
ζ Navis	4 15 47 47	58 21 44 S.	21 41 40	+ 22.63
ψ^2 Cancri	3 26 27 0	5 19 7 N.	11 23 30	+ 19.37
ι vel ρ Navis	4 8 36 54	43 17 23 S.	15 45 8	+ 18.98
57 Camelopardalis	3 17 49 13	41 30 46 N.	15 37 44	+ 38.14
β Cancri	4 1 28 12	10 18 16 S.	12 10 43	+ 17.33
1 ο Urſæ Major	3 20 11 58	40 13 38 N.	16 40 35	+ 34.87
30 Monocerotis	4 7 4 14	22 27 52 S.	13 54 42	+ 16.63
4 δ Hydræ	4 7 31 4	12 24 36 S.	14 7 28	+ 16.13
γ Cancri	4 4 44 58	3 10 37 N.	14 11 18	+ 17.05
7 η Hydræ	4 9 30 52	14 16 0 S.	14 42 56	+ 15.77
δ Cancri	4 5 55 35	0 4 21 N.	14 17 46	+ 16.59
31 Monocerotis	4 12 45 27	24 27 5 S.	15 47 21	+ 15.77
ε Hydræ	4 9 33 53	11 6 54 S.	14 48 38	+ 15.66
ζ Hydræ	4 11 47 31	10 59 3 S.	15 29 52	+ 15.16
α^1 Cancri	4 10 18 44	5 29 35 S.	15 17 35	+ 15.40
ι Urſæ Major	4 0 1 15	29 34 32 N.	17 36 42	+ 22.81
α^2 Cancri	4 10 50 54	5 5 44 S.	15 28 48	+ 15.27
κ Urſæ Major	4 1 8 8	28 57 48 N.	17 53 56	+ 22.03
17 Urſæ Major H	4 4 44 42	20 52 38 N.	17 2 24	+ 18.76
κ Cancri	4 13 22 45	5 35 4 S.	16 12 16	+ 14.63
22 θ Hydræ	4 17 29 10	13 3 8 S.	17 5 44	+ 13.92
38 Lyncis	4 7 46 7	20 5 23 N.	17 56 19	+ 17.37
40 Lyncis	4 9 3 23	17 57 0 N.	17 53 18	+ 16.64
1 κ Leonis	4 12 29 58	10 24 51 N.	17 34 46	+ 14.96
23 *b* Urſæ Major	3 28 0 21	45 8 38 N.	25 10 42	+ 29.93

LONGITUDE.

Names of Stars.		Longitude.	Latitude.	Angle of Poſition.	Annual Variation.
		S. D. M. S.	D. M. S.	D. M. S.	S.
24 *d* Urſæ Major -	-	3 23 31 42	51 13 11 N.	28 44 10	+ 39.60
α Hydræ	-	4 24 29 44	22 23 41 S.	19 5 55	+ 13.13
ϐ Urſæ Major -	-	4 4 30 15	34 55 34 N.	21 47 30	+ 21.23
λ Lyncis	-	4 15 4 39	7 52 32 N.	17 57 16	+ 14.04
5 ξ Leonis	-	4 18 51 29	3 9 49 S.	17 51 57	+ 13.06
ψ Navis	-	5 11 59 55	51 9 47 S.	29 26 13	+ 16.44
ι Hydræ	-	4 24 50 47	14 17 17 S.	19 0 3	+ 12.21
ο Leonis	-	4 21 27 41	3 45 55 S.	18 29 13	+ 12.37
ε Leonis	-	4 17 54 39	9 42 11 N.	18 58 49	+ 13.06
29 υ Urſæ Major -	-	4 3 28 26	42 38 49 N.	26 1 55	+ 23.41
μ Leonis	-	4 18 38 34	12 20 32 N.	19 35 24	+ 12.76
ν Leonis	-	4 25 32 44	2 47 16 S.	19 30 5	+ 11.12
π Leonis	-	4 26 31 21	3 55 19 S.	19 39 2	+ 10.91
η Leonis	-	4 25 6 34	4 51 22 N.	20 3 9	+ 10.79
15 Sextantis	-	5 1 18 59	11 7 40 S.	20 26 53	+ 10.18
Regulus	-	4 27 2 53	0 27 30 N.	20 3 3	+ 10.44
λ Hydræ	-	5 6 35 31	22 0 35 S.	21 53 6	+ 10.14
λ Urſæ Major -	-	4 16 45 9	29 52 39 N.	23 44 38	+ 13.36
ζ Leonis	-	4 24 45 55	11 51 13 N.	20 55 38	+ 10.52
q' Navis	-	5 24 14 23	48 15 41 S.	31 44 24	+ 12.64
γ Leonis	-	4 26 47 55	8 48 19 N.	20 53 17	+ 9.98
μ Urſæ Major -	-	4 18 26 10	28 59 6 N.	23 50 10	+ 12.49
42 μ Hydræ	-	5 12 15 34	24 40 7 S.	23 12 58	+ 9.08
2 ρ Leonis	-	5 3 35 48	0 8 37 N.	21 15 24	+ 8.41
37 Leo Minor -	-	4 26 2 35	21 37 27 N.	23 11 47	+ 9.38
4 ν Hydræ et C. -	-	5 17 35 3	21 48 42 S.	23 45 34	+ 7.11
54 Leonis	-	5 2 42 28	16 29 23 N.	23 8 52	+ 7.17
β Urſæ Major -	-	4 16 36 51	45 6 45 N.	32 32 25	+ 11.24
α Hydræ et C. -	-	5 20 56 9	22 42 42 S.	24 18 47	+ 6.30
α Urſæ Major -	-	4 12 23 4	49 40 11 N.	36 0 5	+ 12.95
χ Leonis	-	5 11 43 54	1 20 52 N.	22 28 24	+ 5.69
52 ψ Urſæ Major -	-	4 26 0 18	35 31 47 N.	28 8 45	+ 7.60
β Hydræ et C. -	-	5 25 46 10	25 37 46 S.	25 18 35	+ 5.41
δ Leonis	-	5 8 30 18	14 19 54 N.	23 29 15	+ 5.26
ϑ Leonis	-	5 10 37 33	9 40 31 N.	23 4 8	+ 5.07
74 φ Leonis	-	5 18 41 54	7 38 33 S.	23 0 32	+ 4.63
53 ξ Urſæ Major -	-	5 4 32 37	24 45 27 N.	25 16 48	+ 5.40
54 ν Urſæ Major -	-	5 3 50 42	26 9 7 N.	25 35 59	+ 5.48
δ Hydræ et C. -	-	5 23 54 41	17 34 42 S.	24 3 3	+ 4.51
σ Leonis	-	5 15 54 57	1 41 47 N.	22 54 26	+ 4.30
ι Leonis	-	5 14 45 34	6 6 8 N.	23 5 42	+ 4.12
14 ε Hydræ et C. -	-	5 23 27 50	13 28 2 S.	23 40 3	+ 4.00
15 γ Hydræ et C. -	-	5 26 27 13	19 39 40 S.	24 30 1	+ 4.08
τ Leonis	-	5 18 43 2	0 33 17 S.	23 2 39	+ 3.69
λ Draconis	-	4 7 30 58	57 13 26 N.	46 23 20	+ 10.54
e Leonis	-	5 21 35 7	5 42 12 S.	23 12 44	+ 3.47
ξ Hydræ et C. -	-	6 5 13 17	31 34 54 S.	27 28 44	+ 3.72
21 θ Hydræ et C. -	-	5 25 48 23	11 17 59 S.	23 41 17	+ 2.94
91 υ Leonis	-	5 22 14 43	3 2 48 S.	23 14 21	+ 2.90
27 ζ Hydræ et C. -	-	6 1 17 49	18 17 3 S.	24 38 4	+ 2.31

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variations.
	S. D. M. S.	D. M. S.	D. M. S.	S.
χ Urſæ Major - -	5 0 51 13	41 32 19 N.	31 56 3	+ 3.26
3 ν Virginis - -	5 21 21 50	4 35 57 N.	23 24 18	+ 2.15
93 Leonis - -	5 16 10 51	17 18 34 N.	24 31 35	+ 2.09
β Leonis - -	5 18 50 26	12 16 57 N.	23 56 28	+ 1.92
β Virginis - -	5 24 19 53	0 41 41 N.	23 22 33	+ 1.72
β Hyd. et C - -	6 10 40 9	31 27 36 S.	27 44 37	+ 1.78
γ Urſæ Major - -	4 27 39 3	47 7 34 N.	35 42 40	+ 2.54
30 η Hyd. et C - -	6 3 18 51	16 4 59 S.	24 26 0	+ 1.29
α Corvi - -	6 9 27 19	21 44 24 S.	25 23 3	+ 0.18
ε Corvi - -	6 8 53 7	19 39 47 S.	25 0 56	+ 0.01
δ Urſæ Major - -	4 28 14 2	51 38 26 N.	39 54 6	— 0.90
γ Corvi - -	6 7 56 52	14 29 23 S.	24 16 42	— 0.50
η Virginis - -	6 2 2 27	1 22 22 N.	23 27 4	— 0.84
δ Corvi - -	6 10 40 20	12 10 27 S.	23 56 49	— 1.77
β Corvi - -	6 14 34 51	18 1 50 S.	24 36 49	— 2.25
κ Draconis - -	4 13 26 1	61 44 47 N.	56 44 51	— 6.62
K Comæ Berenicis -	5 25 38 36	24 7 20 N.	25 42 19	— 2.37
γ Virginis - -	6 7 22 34	2 48 34 N.	23 15 39	— 2.74
ε Urſæ Major - -	5 6 5 46	54 18 25 N.	42 0 44	— 7.21
δ Virginis - -	6 8 41 10	8 38 8 N.	23 15 24	— 3.96
12 Cor. Caroli - -	5 21 45 55	40 7 28 N.	30 39 56	— 5.23
ε - -	6 6 48 56	16 56 57 N.	23 55 28	— 4.64
θ Virginis - -	6 15 26 33	1 45 26 N.	22 38 37	— 5.16
53 - -	6 19 58 27	7 53 36 S.	22 48 32	— 5.49
61 - -	6 22 14 57	9 12 11 S.	22 41 34	— 6.12
γ Hydra - -	6 24 13 33	13 43 30 S.	23 4 35	— 6.32
ι Centauri - -	7 0 21 33	25 59 15 S.	25 0 53	— 7.34
Spica Virginis -	6 21 3 0	2 2 20 S.	22 10 43	— 6.50
ζ Urſæ Major - -	5 12 51 20	56 22 13 N.	42 50 39	— 11.62
ζ Virginis - -	6 19 21 8	8 39 18 N.	22 4 8	— 7.21
ν Centauri - -	7 8 22 29	28 14 47 S.	24 18 37	— 10.90
τ Bootis - -	6 25 9 13	26 32 0 N.	23 54 16	— 8.73
G Centauri - -	7 5 14 33	21 34 57 S.	22 56 19	— 9.93
Urſæ Major - -	5 24 6 37	54 23 40 N.	38 20 25	— 13.20
5 υ Bootis - -	6 16 24 12	25 12 42 N.	23 31 2	— 8.82
η Bootis - -	6 16 31 26	28 6 38 N.	23 52 35	— 9.40
5 θ Centauri - -	7 9 32 23	22 1 13 S.	22 7 29	— 11.80
α Draconis - -	5 4 36 37	66 21 20 N.	59 33 0	— 23.79
κ Virginis - -	7 1 42 1	2 55 25 N.	20 4 51	— 10.31
99 ι Virginis - -	7 0 59 26	7 14 41 N.	20 2 26	— 10.46
κ Bootis - -	5 27 6 32	58 53 59 N.	41 3 16	— 17.30
Arcturus - -	6 21 26 24	30 52 35 N.	23 16 3	— 11.18
λ Virginis - -	7 4 9 30	0 30 36 N.	19 43 14	— 10.88
λ Bootis - -	6 4 9 24	54 39 8 N.	35 37 30	— 15.63
ι Bootis - -	5 28 16 45	58 50 40 N.	40 36 10	— 17.47
φ Virginis - -	7 2 39 38	11 46 56 N.	19 35 34	— 11.33
θ Bootis - -	5 29 45 37	60 8 19 N.	41 10 26	— 18.78
ρ Bootis - -	6 19 58 49	42 27 40 N.	25 57 45	— 13.69
γ Bootis - -	6 24 51 20	49 33 30 N.	29 46 33	— 15.18
5 α Urſæ Minor - -	4 5 32 54	71 25 22 N.	93 40 53	— 51.95

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variations.
	S. D. M. S.	D. M. S.	D. M. S.	S.
29 π Bootis	6 29 2 58	30 22 52 N.	21 22 53	— 12.85
ζ Bootis	7 0 13 45	27 53 47 N.	20 49 34	— 12.70
107 μ Virginis	7 7 19 16	9 42 27 N.	18 31 43	— 12.40
109 Virginis	7 5 43 19	17 7 29 N.	18 53 4	— 12.62
ε Bootis	6 25 17 51	40 38 25 N.	24 2 45	— 14.27
2 α Libræ	7 12 17 35	0 21 39 N.	17 46 20	— 13.32
37 ζ Bootis	7 0 43 43	33 47 17 N.	21 21 13	— 13.83
δ Libræ	7 12 29 18	8 16 16 N.	17 14 13	— 13.66
β Urſæ Minor	4 10 27 49	72 58 19 N.	94 39 40	— 52.50
γ Scor. vel Lib.	7 17 53 53	7 37 2 S.	17 3 33	— 15.02
β Bootis	6 21 25 30	54 10 4 N.	29 30 36	— 18.34
24 ι Libræ	7 18 12 40	1 49 18 N.	16 18 4	— 15.02
β Libræ	7 16 34 50	8 31 20 N.	16 4 18	— 14.70
δ Bootis	7 0 19 40	48 59 14 N.	24 30 55	— 17.63
δ Lupis	7 25 49 50	21 24 33 S.	16 57 6	— 19.09
ε Libræ	7 18 33 2	8 4 38 N.	15 30 20	— 15.16
51 μ Bootis	7 0 22 8	53 26 16 N.	25 52 54	— 19.25
11 γ^1 Urſæ Minor	4 18 46 30	74 56 32 N.	92 53 2	— 50.62
β Coronæ	7 6 19 8	46 4 20 N.	21 42 2	— 17.64
ι Draconis	6 2 5 4	71 5 50 N.	52 0 11	— 30.41
13 γ^2 Urſæ Minor	4 18 43 29	75 13 40 N.	93 50 43	— 51-32
35 ζ Libræ	7 22 13 22	2 15 35 N.	14 42 46	— 16.05
γ Lupis	7 28 42 33	21 12 59 S.	15 46 40	— 20.29
γ Libræ	7 22 20 23	4 24 37 N.	14 31 43	— 16.05
39 Libræ	7 25 49 2	8 28 49 S.	14 36 12	— 17.58
δ Serpentis	7 15 32 38	28 54 18 N.	16 31 6	— 15.92
α Cor. Borealis	7 9 28 21	44 20 51 N.	10 15 23	— 17.65
40 Libræ	7 26 33 30	9 59 28 S.	14 32 46	— 17.95
κ Libræ	7 24 57 50	0 0 38 N.	13 59 36	— 16.82
ζ Coronæ	7 5 27 18	53 58 0 N.	24 3 46	— 20.08
η Libræ	7 24 33 32	4 1 41 N.	13 49 55	— 16.59
γ Coronæ	7 12 4 11	44 31 35 N.	19 21 52	— 18.06
α Serpentis	7 19 15 59	25 31 38 N.	15 10 44	— 16.23
λ } Serpentis	7 19 36 57	26 34 10 N.	15 6 6	— 16.38
β }	7 17 8 19	34 21 10 N.	16 22 19	— 16.90
μ } Serpentis	7 23 8 42	16 16 0 N.	13 50 6	— 16.37
ε }	7 21 31 29	24 1 32 N.	14 24 10	— 16.50
δ Coronæ	7 14 13 24	44 47 32 N.	18 37 36	— 18.41
λ Libræ	7 27 40 53	0 6 43 N.	13 3 26	— 17.49
θ Libræ	7 27 4 23	3 29 28 N.	13 1 18	— 17.19
38 ρ Serpentis	7 16 42 44	40 1 26 N.	17 4 32	— 17.76
ρ } Scorpii	8 0 21 8	8 34 6 S.	12 57 59	— 18.93
π }	8 0 8 48	5 26 45 S.	12 41 19	— 18.53
η Lupis	8 2 58 45	17 25 7 S.	13 41 16	— 21.17
48 ψ Libræ	7 27 36 16	6 6 42 N.	12 41 4	— 17.22
γ Serpentis	7 19 56 3	35 17 6 N.	15 29 6	— 17.45
δ Scorpii	7 29 46 37	1 57 26 S.	12 29 18	— 18.13
ζ Urſæ Minor	3 24 28 17	75 7 56 N.	124 52 4	— 84.48
ξ^1 Libræ	7 28 30 48	9 15 44 N.	12 13 27	— 17.34
π Serpentis	7 19 19 37	42 28 32 N.	16 25 22	— 18.57

Names of Stars.	Longitude.				Latitude.				Angle of Poſition.			Annual Variation.
	S.	D.	M.	S.	D.	M.	S.		D.	M.	S.	S.
β Scorpii	8	0	23	42	1	2	8	N.	12	1	35	— 18.06
9 ω¹ Scorpii	8	0	52	32	0	14	28	N.	11	54	40	— 18.22
θ Draconis	6	13	53	1	74	26	47	N.	48	50	2	— 33.59
ν Scorpii	8	1	50	55	1	39	47	N.	11	27	21	— 18.32
δ Ophiuchi	7	29	30	23	17	16	35	N.	11	40	33	— 17.52
18 Scorpii	8	0	41	31	12	45	17	N.	11	20	50	— 17.70
ε Ophiuchi	8	0	42	35	16	27	49	N.	11	15	53	— 17.71
σ Scorpii	8	5	0	25	4	0	27	S.	10	42	25	— 19.56
γ Herculis	7	26	24	51	40	1	51	N.	13	31	32	— 18.97
τ Herculis	7	11	32	54	65	50	58	N.	25	48	24	— 26.14
Antares	8	6	58	9	4	32	29	S.	9	58	45	— 20.05
φ Ophiuchi	8	5	52	26	5	13	39	N.	9	45	24	— 18.87
10 λ Ophiuchi	8	2	47	46	23	35	14	N.	10	29	54	— 18.18
η Draconis	6	11	35	4	78	26	57	N.	56	6	42	— 38.69
β Herculis	7	28	17	41	42	43	48	N.	13	2	20	— 19.61
29 *b* Herculis	8	1	26	12	33	1	34	N.	11	13	16	— 18.66
τ Scorpii	8	8	39	48	6	5	25	S.	9	25	32	— 20.64
ζ Ophiuchi	8	6	26	0	11	25	4	N.	9	18	28	— 18.65
σ Herculis	7	20	25	20	63	11	2	N.	20	14	57	— 25.11
15 A Draconis	8	2	24	58	81	2	1	N.	96	21	7	— 51.91
ζ Herculis	7	28	42	19	53	7	12	N.	14	6	47	— 21.94
η Herculis	7	25	57	54	60	19	10	N.	16	44	31	— 24.14
ι Scorpii	8	12	34	28	11	41	24	S.	8	15	41	— 22.55
μ¹ Scorpii	8	13	21	43	15	23	40	S.	8	17	2	— 23.60
μ² Scorpii	8	13	27	15	15	20	58	S.	8	14	9	— 23.70
25 ι Ophiuchi	8	7	51	8	32	31	58	N.	8	46	57	— 19.26
27 κ Ophiuchi	8	9	2	45	31	52	0	N.	8	18	24	— 19.31
ε Herculis	8	5	31	45	53	16	28	N.	11	7	20	— 22.40
η Ophiuchi	8	15	10	24	7	13	13	N.	6	4	8	— 20.03
21 μ Draconis	7	21	56	8	76	15	20	N.	25	20	7	— 33.53
α Herculis	8	13	21	21	37	18	44	N.	6	46	11	— 20.10
δ Herculis	8	11	57	53	47	43	21	N.	7	49	26	— 21.50
ε Urſæ Minor	3	6	19	53	73	53	52	N.	160	45	46	— 146.12
π Herculis	8	9	16	1	59	34	45	N.	10	10	22	— 24.43
22 ζ Draconis	5	19	17	28	84	52	54	N.	88	47	30	— 49.83
ρ Ophiuchi	8	18	5	47	2	3	37	N.	5	2	36	— 20.89
53 ν Serpentis	8	17	29	55	10	17	34	N.	5	4	4	— 20.01
θ Ophiuchi	8	18	36	5	1	48	47	S.	4	58	22	— 21.51
70 Herculis	8	13	59	11	47	31	11	N.	6	56	44	— 21.56
75 ρ Herculis	8	12	34	27	60	9	15	N.	8	37	35	— 24.72
34 υ Scorpii	8	21	13	8	13	53	45	S.	4	22	20	— 24.66
λ Scorpii	8	21	47	30	13	45	36	S.	4	4	44	— 24.63
α Ophiuchi	8	19	38	30	35	52	37	N.	4	12	30	— 20.28
β Draconis	8	9	9	8	75	18	14	N.	13	26	52	— 32.48
ξ Serpentis	8	21	45	27	7	58	5	N.	3	23	33	— 20.51
57 μ Ophiuchi	8	21	31	34	15	14	34	N.	3	23	49	— 20.00
ν¹ Draconis	8	7	27	38	78	10	5	N.	15	33	46	— 34.83
ν² Draconis	8	7	31	57	78	9	38	N.	15	30	37	— 34.83
κ Scorpii	8	23	40	30	15	37	2	S.	3	13	51	— 25.47
β Ophiuchi	8	22	32	48	27	57	35	N.	2	58	14	— 19.94

LONGITUDE.

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variation.
	S. D. M. S.	D. M. S.	D. M. S.	S.
1462 ι Scorpii	8 24 43 53	16 41 11 S.	2 44 14	— 25.96
ι Herculis	8 17 5 18	69 17 38 N.	7 22 32	— 28.68
γ Teleſcopi	8 25 7 24	13 35 42 S.	2 25 41	— 24.91
γ Ophiuchi	8 23 50 27	26 8 40 N.	2 27 6	— 19.94
ω Draconis	4 9 24 37	86 53 42 N.	135 31 45	— 55.20
μ Herculis	8 22 27 23	51 10 33 N.	3 23 21	— 22.53
64 ν Ophiuchi	8 26 57 39	13 42 0 N.	1 13 39	— 20.27
θ Herculis	8 25 41 7	60 42 43 N.	2 9 29	— 25.12
ζ Serpentis	8 27 19 35	19 46 49 N.	1 3 59	— 21.03
ξ Herculis	8 26 24 11	52 42 55 N.	1 38 28	— 22.92
32 ξ Draconis	8 21 55 38	80 18 14 N.	5 52 43	— 36.61
67 [illegible] Ophiuchi	8 27 23 13	26 24 0 N.	1 2 30	— [illegible]
68 κ Ophiuchi	8 27 41 13	24 46 49 N.	0 55 16	— 20.00
γ Draconis	8 25 10 46	74 57 4 N.	3 4 57	— 32.12
γ^1 Sagittarii	8 28 18 13	6 7 2 S.	0 46 36	— 22.99
γ^2 Sagittarii	8 28 28 15	6 57 3 S.	0 42 21	— 23.19
95 Herculis	8 27 42 7	45 3 38 N.	0 59 3	— 21.51
70 P Ophiuchi	8 28 42 25	26 1 18 N.	0 30 55	— 20.03
34 ψ^2 Draconis	3 1 5 33	84 30 38 N.	178 35 25	— 64.83
103 ο Herculis	8 29 54 27	52 12 44 N.	0 2 31	— 22.82
μ^1 Sagittarii	9 0 25 12	2 22 13 N.	0 10 45	+ 21.45
β Teleſcopi	9 0 50 27	13 20 25 S.	0 25 6	+ 24.99
δ Sagittarii	9 1 47 3	6 26 29 S.	0 49 10	+ 23.06
20 ε Sagittarii	9 2 17 12	11 0 59 S.	1 6 15	+ 24.24
η Serpentis	9 2 55 21	20 30 10 N.	1 9 53	+ 20.01
109 Herculis	9 4 59 47	45 5 32 N.	2 8 21	+ 21.49
λ Sagittarii	9 3 31 32	2 5 48 S.	1 33 17	+ 22.12
1 *m* Aquilæ	9 6 13 37	14 57 59 N.	2 30 8	+ 20.11
44 χ Draconis	2 13 30 14	83 32 0 N.	157 43 42	+ 66.68
α Lyræ	9 12 30 42	61 44 44 N.	6 20 17	+ 25.38
φ Sagittarii	9 7 23 6	3 55 41 S.	3 17 55	+ 22.26
l Aquilæ	9 9 35 21	18 12 55 N.	3 49 4	+ 19.83
23 δ Urſæ Minor	2 28 24 13	69 55 17 N.	169 20 29	+ 329.35
111 Herculis	9 12 4 25	41 2 20 N.	5 1 25	+ 20.74
β Lyræ	9 16 6 20	56 0 38 N.	7 34 51	+ 23.48
σ Sagittarii	9 9 35 25	3 25 5 S.	4 15 8	+ 21.98
θ^2 Serpentis	9 12 57 48	26 54 10 N.	5 8 14	+ 19.65
δ^2 Lyræ	9 18 53 45	59 20 33 N.	9 15 0	+ 24.41
ο Draconis	10 12 11 43	80 49 15 N.	31 26 6	+ 38.16
ζ Sagittarii	9 10 50 49	7 9 4 S.	4 58 17	+ 22.59
ε Aquilæ	9 15 28 56	37 35 51 N.	6 18 45	+ 20.20
12 *i* Aquilæ	9 13 15 29	16 52 27 N.	5 16 8	+ 19.62
γ Lyræ	9 19 8 47	55 2 17 N.	8 54 4	+ 23.11
ο Sagittarii	9 12 11 49	0 53 30 N.	5 12 24	+ 21.02
50 Draconis	2 9 35 22	80 22 34 N.	147 5 31	+ 76.21
τ Sagittarii	9 12 2 41	5 2 46 S.	5 23 51	+ 22.01
λ Antinoi	9 14 32 43	17 35 48 N.	5 45 48	+ 19.50
ζ Aquilæ	9 17 0 46	36 13 2 N.	6 53 2	+ 19.97
52 υ Draconis	1 17 38 29	83 12 12 N.	124 23 13	+ 59.67
π Sagittarii	9 13 27 31	1 28 3 N.	5 42 35	+ 20.80

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variations.
	S. D. M. S.	D. M. S.	D. M. S.	S.
δ Draconis	0 14 31 38	82 52 55 N.	87 46 11	+ 49.39
κ Cygni	10 12 10 30	73 49 1 N.	26 22 45	+ 31.60
δ Aquilæ	9 20 50 2	24 50 26 N.	8 9 5	+ 18.96
60 τ Draconis	1 22 14 32	80 40 9 N.	123 35 12	+ 14.30
π Draconis	0 0 45 19	81 49 50 N.	72 33 8	+ 45.08
6 Vulpis	9 26 44 30	45 53 14 N.	11 20 8	+ 20.61
β Cygni	9 28 28 41	48 59 26 N.	12 21 58	+ 21.12
μ Aquilæ	9 24 0 50	28 41 31 N.	9 23 46	+ 18.81
κ Aquilæ	9 22 3 56	14 22 17 N.	8 40 38	+ 18.77
ι Antinoi	9 23 2 58	20 2 12 N.	8 58 25	+ 18.61
θ Cygni	10 15 53 32	69 37 25 N.	26 16 24	+ 28.56
α Sagittæ	9 28 17 34	38 49 4 N.	11 25 6	+ 19.35
β -	9 28 25 31	38 14 42 N.	11 26 2	+ 19.26
61 σ Draconis	0 28 18 29	80 55 12 N.	96 46 59	+ 52.10
γ Aquilæ	9 28 9 12	31 16 7 N.	11 0 12	+ 18 54
δ Cygni	10 13 29 26	64 25 50 N.	22 39 29	+ 25.56
α Aquilæ	9 28 57 12	29 18 50 N.	11 14 7	+ 18.29
η Antinoi	9 27 38 51	21 32 53 N.	10 38 55	+ 18.05
β Aquilæ	9 29 38 33	26 42 39 N.	11 25 13	+ 18.02
γ Sagittæ	10 4 15 34	39 12 49 N.	13 42 40	+ 18 77
θ Antinoi	10 2 7 30	18 45 3 N.	12 13 44	+ 17.29
1 α Capricorni	10 0 58 39	7 0 44 N.	12 8 54	+ 17.49
2 α Capricorni	10 1 3 51	6 57 18 N.	12 10 53	+ 17.48
30 o¹ Cygni	10 25 17 36	63 42 33 N.	28 14 13	+ 24.59
β Capricorni	10 1 15 11	4 36 46 N.	12 22 26	+ 17.52
γ Cygni	10 22 5 5	57 8 23 N.	24 4 15	+ 21.60
41 ι Cygni	10 17 56 45	47 28 1 N.	19 54 11	+ 18.80
ε Delphinis	10 11 16 45	29 5 40 N.	15 30 13	+ 16.49
ζ Delphinis	10 12 58 34	32 10 23 N.	16 14 15	+ 16.58
71 Aquilæ	10 8 55 45	16 48 33 N.	14 29 51	+ 15.99
β Delphinis	10 13 33 18	31 56 26 N.	16 25 12	+ 16.45
α Delphinis	10 14 35 52	33 2 31 N.	16 50 35	+ 16.43
δ Delphinis	10 15 20 21	31 57 48 N.	17 0 2	+ 16.16
α Cygni	11 2 34 45	59 55 0 N.	29 44 54	+ 21.94
ε Aquarii	10 8 55 54	8 6 12 N.	14 43 47	+ 15.75
γ Delphinis	10 16 35 47	32 43 49 N.	17 27 50	+ 16.05
ε Cygni	10 24 56 24	49 25 35 N.	22 56 1	+ 18.45
54 λ Cygni	10 26 58 56	51 37 32 N.	24 17 53	+ 18.92
η Cephei	0 1 46 56	71 44 42 N.	55 18 7	+ 31.53
μ Aquarii	10 10 15 58	8 15 39 N.	15 8 13	+ 15.45
58 ν Cygni	11 3 22 57	54 55 27 N.	27 52 23	+ 19.39
62 ξ Cygni	10 8 2 41	56 35 23 N.	30 24 19	+ 19.59
γ Equulei	10 20 38 40	25 12 31 N.	18 10 55	+ 14.30
ζ Cygni	11 0 16 20	43 42 36 N.	23 23 21	+ 15.93
δ Equulei	10 21 40 0	24 46 2 N.	18 26 51	+ 14.03
α Equulei	10 20 19 46	20 8 42 N.	17 54 16	+ 13.83
τ Cygni	11 5 49 2	50 32 36 N.	27 7 56	+ 17.23
67 σ Cygni	11 7 35 18	51 30 5 N.	28 5 12	+ 17.32
ε Pegaſi	10 27 31 26	33 17 50 N.	20 48 20	+ 14.10
β Equulei	10 22 38 51	21 2 48 N.	18 33 29	+ 13.40
α Cephei	0 10 2 3	68 54 41 N.	55 55 0	+ 28.13
ζ Capricorni	10 14 8 28	6 58 15 S.	17 34 11	+ 14.34

Names of Stars.	Longitude.	Latitude.	Angle of Poſition.	Annual Variation.
	S. D. M. S.	D. M. S.	D. M. S.	S.
β Aquarii	10 20 36 16	8 37 57 N.	18 2 24	+ 12.87
ε Capricorni	10 17 24 10	4 57 29 S.	18 13 8	+ 13.30
β Cephei	1 2 48 38	71 8 7 N.	74 33 52	+ 35.87
ϱ Cygni	11 17 23 36	55 11 38 N.	33 9 5	+ 17.48
γ Capricorni	10 18 59 14	2 32 6 S.	18 22 12	+ 12.85
91 vel μ Piſcis Auris	10 14 27 0	18 18 53 S.	19 38 15	+ 14.43
ε Pegaſi	10 29 5 58	22 6 47 N.	20 14 15	+ 12.02
π' Cygni	11 25 31 47	58 52 40 N.	38 24 39	+ 18.52
μ Cygni	11 7 40 24	39 31 32 N.	24 37 11	+ 13.37
κ Pegaſi	11 6 8 53	36 39 9 N.	23 38 23	+ 12.98
10 θ Piſcis Auris	10 15 48 54	16 32 11 S.	19 38 7	+ 13.84
δ Capricorni	10 20 44 25	2 33 50 S.	18 48 41	+ 12.30
γ Gruis	10 14 36 38	23 1 46 S.	20 52 31	+ 14.40
α Aquarii	11 0 33 45	10 40 34 N.	20 17 48	+ 10.35
ι Aquarii	10 25 55 32	2 3 45 S.	19 57 2	+ 10.69
14 μ vel ι Piſcis Auris	10 19 18 38	20 3 43 S.	21 20 48	+ 12.36
24 ι Pegaſi	11 11 36 51	34 16 7 N.	24 30 38	+ 11.17
26 θ Pegaſi	11 4 1 57	16 21 25 N.	21 4 10	+ 10.04
21 ζ Cephei	0 11 13 12	61 8 32 N.	46 10 39	+ 17.93
θ Aquarii	11 0 27 58	2 43 21 N.	20 31 19	+ 9.64
ε Cephei	0 10 16 2	59 57 19 N.	44 33 54	+ 16.87
γ Aquarii	11 3 55 5	8 14 54 N	20 58 31	+ 9.14
π Aquarii	11 5 48 30	10 29 3 N.	21 17 58	+ 8.85
ζ Aquarii	11 6 6 37	8 51 30 N.	21 21 19	+ 8.58
β Piſcis Auris	10 24 22 33	21 20 44 S.	22 48 7	+ 10.12
5 Lacertæ	0 2 27 54	51 24 15 N.	35 26 48	+ 12.19
27 δ Cephei	0 14 51 9	59 31 58 N.	45 35 3	+ 15.45
7 Lacertæ	0 5 22 24	53 17 29 N.	37 24 25	+ 12.58
η Aquarii	11 7 36 39	8 9 38 N.	21 36 31	+ 8.05
γ vel ε Piſcis Auris	10 28 31 40	17 15 25 S.	22 38 21	+ 8.72
ζ Pegaſi	11 13 21 47	17 41 19 N.	22 46 46	+ 7.65
η Pegaſi	11 22 56 27	35 6 3 N.	26 54 45	+ 8.43
λ Pegaſi	11 20 15 34	28 46 24 N.	25 8 9	+ 7.68
μ Pegaſi	11 21 36 1	29 23 43 N.	25 27 1	+ 7.43
λ Aquarii	11 8 46 55	0 22 48 S.	22 3 12	+ 6.72
ι Cephei	1 0 30 26	62 36 10 N.	54 43 56	+ 15.78
δ Aquarii	11 6 4 49	8 10 49 S.	22 21 29	+ 6.81
Fomalhaut	11 0 58 40	21 14 44 S.	23 55 20	+ 7.34
ο Andromedæ	0 5 0 43	43 44 49 N.	31 50 51	+ 7.70
β Piſcium	11 15 47 49	9 3 38 N.	22 44 8	+ 5.71
β Pegaſi	11 26 34 57	31 8 19 N.	26 29 45	+ 6.37
α Pegaſi	11 20 41 59	19 24 47 N.	23 54 22	+ 5.79
88 c² Aquarii	11 7 12 52	14 28 51 S.	23 22 14	+ 5.71
φ Aquarii	11 14 20 52	1 2 5 S.	22 43 55	+ 4.88
γ Piſcium	11 18 37 28	7 16 39 N.	22 59 46	+ 4.61
16 λ Andromedæ	0 15 31 27	43 47 25 N.	33 6 23	+ 3.99
17 ι Andromedæ	0 13 18 45	41 1 20 N.	31 31 9	+ 3.71
19 κ Andromedæ	0 14 31 23	41 42 44 N.	31 56 28	+ 3.51
γ Cephei	1 27 18 29	64 38 21 N.	67 16 42	+ 10.74
29 Piſcium	11 26 25 5	2 57 30 S.	23 28 57	+ 0.74
33 Piſcium	11 26 8 55	5 46 12 S.	23 35 13	+ 0.43
α Andromedæ	0 11 31 36	25 41 47 N.	26 13 22	+ 0.19
β Caſſiopeæ	1 2 19 23	51 13 30 N.	39 28 54	+ 0.23

Longitude, *Angle of.* See Angle.

Longitude, *Argument of.* See Argument.

Longitude, *Circles of.* See Circle.

Longitude, *Degrees of.* See Degree.

Longitude, *Parallax of.* See Parallax.

Longitude, *Refraction of.* See Refraction.

Longitude *of Motion,* is uſed by Dr. Wallis for the meaſure of motion, eſtimated according to the line of direction; on which principle, longitude of motion is the diſtance, or length, which the centre of any moving body runs through, as it moves on in a right line.

The ſame author calls the meaſure of any motion, eſtimated according to the line of direction of the vis motrix, the *altitude* of it.

Bellini alſo uſes the terms longitude and altitude in the ſame ſenſe, in many places of his writings, which an ordinary reader finds hard to underſtand, for want of this interpretation. By *altitude* alſo in his 19th propoſition De Febribus, he makes the thickneſs of the viſcid matter in the blood-veſſels; or the greateſt length a viſcid particle is extended into, from the ſide of a canal to its axis.

LONGITUDINALIS Sinus, a name given to two of the venous cavities of the dura mater; they are diſtinguiſhed by the epithets ſuperior and inferior. See Vein.

LONGJUMEAU, in *Geography*, a town of France, in the department of the Seine and Oiſe, and chief place of a canton, in the diſtrict of Corbeil; 10 miles S. of Paris. The place contains 1434, and the canton 13,650 inhabitants, on a territory of 47½ kiliometres, in 25 communes.

LONGNESS Point, a cape on the S. coaſt of the Iſle of Man; 10 miles S.S.W. of Douglas.

LONGOBARDO, a town of Naples, in Calabria Citra; 10 miles S.W. of Coſenza.

LONGOBUCO, a town of Naples, in Calabria Citra; 14 miles S. of Roſano.

LONGOMONTANUS, Christian, in *Biography*, an eminent Daniſh aſtronomer, ſon of a labouring peaſant, was born at Longomontium, a village in Jutland, whence he took his ſurname, in the year 1562. His father was anxious to afford him a good education, but dying before he was eight years of age, he was committed to the care of an uncle, who finding the expence devolved on him by the lad more than he could bear, adviſed him to return to his mother, and to earn his living by the ſweat of his brow. The youth, who ſhewed a great inclination for learning, was mortified at the propoſal, but not wholly diſheartened; he returned to the labours of an agricultural life, and at the ſame time improved every leiſure moment in acquiring uſeful knowledge. At length he was driven, by the jealouſies of his brothers, to quit his home, and he ſought an aſylum at Wiburg, where there was a college. Here he ſpent eleven years, and made great progreſs in the mathematical ſciences, though he was at the ſame time obliged to ſupport himſelf by his induſtry. From Wiburg he went to Copenhagen, and became an aſſiſtant to Tycho Brahe, with whom he continued eight years. During this perod, he afforded Tycho much aſſiſtance in obſerving the heavens and in his calculations, and was ſo accurate and laborious, and at the ſame time ſo ſkilful, that he became the confidential friend of that great man. At length he returned to his native country, with the higheſt recommendations from Tycho, who furniſhed him with money to defray the expences of ſo long a journey. He travelled through Poland, in order that he might have a ſight of the place which witneſſed Copernicus's aſtronomical labours. At Copenhagen he met with a noble-hearted patron in the chancellor Chriſtian Friis, who afforded him an honourable employment in his family. In 1605 he was nominated to a profeſſorſhip of mathematics in the univerſity of Copenhagen, a ſituation which had ever been the object of his higheſt ambition, and for which his genius and talents peculiarly qualified him; and he diſcharged the duties of it with the greateſt ability, and higheſt reputation, till his death, which took place in 1647, when he was about the age of eighty-five. He was author of many valuable works, of which the moſt diſtinguiſhed is entitled "Aſtronomia Danica," which contains all the great diſcoveries of Regiomontanus, Purbach, and Tycho Brahe. The titles of his other works are given in Hutton's Dictionary. Obſcure as his native place and father were, he contrived to immortalize both, by taking his name from the village, and in the title-page to ſome of his works, calling himſelf Severini filius, his father's name being Severin, or Severinus.

LONGOTOMA, in *Geography*, a town of Chili, on the N. ſide of a river of the ſame name, that runs into the Pacific ocean, S. lat. 31° 30′. The town is diſtant 84 miles S. from Coquimbo.

LONGSPIEL, a very ancient muſical inſtrument, found by ſir Joſeph Banks and Dr. Solander in Iceland, when they viſited that country in 1773. This inſtrument, of a long and narrow form, and ſtrung with four ſtrings of copper, is extremely rude and clumſy. One of the four ſtrings is uſed as a drone, the reſt are played with a bow. Pieces of wood are placed at different diſtances on the finger-board, to ſerve as frets. It ſeems, indeed, to have been the primitive idea of a fiddle, and is a proof that the uſe of the bow, that wonderful engine, which the ancients, with all their ingenuity and muſical refinements, had never been able to diſcover, and which has been rendered ſo miraculous, was known by the Scalds in Iceland, at leaſt as early as in any other part of Europe. See Scalds.

LONG-TAN, in *Geography*, a town of Corea; 42 miles S. of Hetſin.

LONG-TCHANG-CHING, a town of China, in Chang-tong; 15 miles E. of Tci-nan.

LONG-TCHIAN, a mountain of Thibet. N. lat. 27° 48′. E. long. 86° 39′.

LONG-TCHUEN, a town of Corea; 55 miles W.N.W. of Han-tcheou.

LONGTOWN, a market town in the pariſh of Arthuret and ward of Eſkdale, in the county of Cumberland, England, is ſituated on the borders of Scotland, near the conflux of the rivers Eſk and Liddel, 9 miles diſtant from Carliſle, and 313 N. from London. The houſes are moſtly built in the modern ſtyle, and ſome of the ſtreets are regular and ſpacious. At the north-end of the town is a ſtone bridge over the Eſk. Longtown was returned to parliament, in the year 1801, as containing 176 houſes, inhabited by 1335 perſons, of whom 648 were ſtated to be employed in trades and manufactures. A market is held on Thurſdays; and two fairs annually. Longtown ſtands in the midſt of the eſtate of ſir James Graham, of Netherby, whoſe predeceſſor, Dr. Robert Graham, may be conſidered as having been the principal cauſe of the proſperous ſtate of this part of Cumberland. Under his patronage Longtown became populous; and by conſtructing the little harbour at Sarkfoot, he furniſhed the people with an eaſy mode of exporting their produce and ſupplying themſelves with neceſſaries.

Netherby, the ſeat of ſir James Graham, is much celebrated in the topographical annals of this county, from the vaſt improvements that were made here during the latter part of the laſt century; nor is it leſs intereſting to the antiquary from the aſſemblage of Roman remains that have been here preſerved; and from its having been a Roman ſtation.

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ſtation. The manſion, which ſtands on an eminence near the river Eſk, was erected by the late Dr. Graham, about the year 1760, but has been much improved by the preſent proprietor. It is elegantly fitted up; and contains a valuable collection of ancient and modern medals, and a library furniſhed with a ſelection of claſſic and other valuable authors. The gardens and pleaſure grounds are diſpoſed with much taſte and judgment. Beauties of England and Wales, vol. iii.

LONGUE', a town of France, in the department of the Maine and Loire, and chief place of a canton, in the diſtrict of Baugé; 10 miles S. of Baugé. The place contains 5003, and the canton 13,935 inhabitants, on a territory of 280 kiliometres, in 17 communes.

Longué, a ſmall iſland in the Indian ſea; 10 miles N. of Mauritius.

LONGUEIL, Christopher de, in *Biography*, born at Mechlin in 1488, was natural ſon of Antony de Longueil, biſhop of Leon, and chancellor of Anne, queen of Bretagne. He was taken to Paris while he was very young, and carefully educated in claſſical learning and the ſciences. After this he ſtudied the law, practiſed in the profeſſion, and obtained the place of a counſellor in parliament. He travelled into Italy, Spain, England, Germany, and Switzerland, for the purpoſe of improvement. At Rome he made an harangue before pope Leo X., who highly admired his eloquence. He died at Padua, at the age of thirty-four. His works conſiſt of epiſtles and harangues: they were publiſhed at Paris in 1553, with his life, by cardinal Pole. He acquired a great reputation among thoſe ſcholars in that age who were ambitious of being the cloſe imitators of the ſtyle of Cicero, and were, on that account, termed *Ciceronians.* Eraſmus beſtows great praiſes on his genius and acquiſitions, but laments that all the force of his powers ſhould have been devoted to this one object.

Longueil, in *Geography*, a townſhip of Glengary county, in Upper Canada, being the ſecond in aſcending the Ottawa river.

LONGUEVAL, James, in *Biography*, a learned French Jeſuit, deſcended from a family in humble life, was born near Peronne, in Picardy, in the year 1680. He was educated in grammar-learning at Amiens, and purſued his maturer ſtudies at Paris, where he was ſoon diſtinguiſhed among his fellow ſtudents by his proficiency in learning. In the year 1699, he entered into the ſociety of Jeſuits, and after he had completed his ſtudies, he taught the belles-lettres at the college of La Fleche with great applauſe, during about five years, when he commenced his lectures in divinity and the ſacred ſcriptures. He died in the year 1735, at the age of fifty-five. His reputation as a writer, is chiefly founded on his elaborate hiſtory of the Gallican church, of which he lived to publiſh eight volumes: theſe bring the hiſtory down to the year 1137. This work diſplays profound erudition and deep reſearch, and is written in a beautifully ſimple ſtyle. While he was engaged on this work he was allowed an annual penſion of 800 livres by the French clergy, whoſe eſteem he had ſecured by his learned labours, his piety, and the amiableneſs of his manners. The work, afterwards completed by fathers Brumoy and Berthier, made 18 vols. 4to. Moreri.

LONGUEVILLE, in *Geography*, a town of France, in the department of the Lower Seine, and chief place of a canton, in the diſtrict of Dieppe; 9 miles S. of Dieppe. The place contains 430, and the canton 7875 inhabitants, on a territory of 130 kiliometres, in 29 communes.

LONGUS, in *Biography*, author of a romance in Greek proſe, entitled "Paſtorals," and relating to the loves of Daphnis and Chloe, is ſuppoſed to have lived in the reign of Theodoſius the Great. His work is a curious ſpecimen of that kind of compoſition in its ſimpleſt form, and is ſaid to contain many deſcriptive beauties; but ſome of its ſcenes are ſuch as the loweſt modern writer would ſcarcely venture to paint. The beſt edition is that of Villoiſon, Gr. et Lat. 8vo. in two vols. Paris 1778.

Longus, *Long*, an epithet given by *Anatomiſts* to a great number of muſcles, hereby contradiſtinguiſhed from brevis.

Longus *Colli*, præ-dorſo-atloidien of Dumas, is a muſcle ſituated on the anterior and lateral parts of the bodies of the three firſt vertebræ of the back, and the ſix laſt of the neck. It extends from the body of the third dorſal vertebra to the anterior arch of the atlas. It is elongated, broad in the middle, and pointed at the ends. On the front it is covered by the rectus capitis anticus, the pharynx, the carotid artery, the nerve of the eighth pair, and the œſophagus. Its poſterior ſurface covers the lateral portion of the anterior ſurface of the bodies of the three firſt dorſal, and ſix laſt cervical vertebræ, to which it is attached, as well as to the intervertebral ligaments. It is alſo attached to the front edge of the tranſverſe proceſſes of the five laſt cervical vertebræ; and it covers the vertebral artery in the intervals of theſe proceſſes. The outer edge of the muſcle is attached below to the bodies of the two firſt dorſal vertebræ: here it is ſeparated from the anterior ſcalenus by an interval in which the vertebral artery and vein are found. This margin is then fixed to the front of the tranſverſe proceſſes of the five laſt cervical vertebræ; and it is unattached in the reſt of its extent. The internal edge is fixed to the longitudinal line, which may be obſerved on the front of the bodies of the two firſt dorſal, and the ſix laſt cervical vertebræ. Between theſe bones it is attached to the intervertebral ligaments. The inferior extremity is attached to the front and lateral portion of the body of the third dorſal vertebra: from this point it riſes nearly parallel to that of the oppoſite ſide, becoming larger as far as the middle: then it gradually decreaſes to the ſuperior extremity. The latter, joined to the oppoſite muſcle, is attached to the tubercle of the anterior arch of the atlas. It is rather difficult to develop the ſtructure of this muſcle: its fleſhy fibres are placed obliquely between aponeuroſes, ſome of which cover the anterior ſurface, both above and below, while others are ſituated in the ſubſtance of the muſcle. Theſe fibres are ſhort, although the muſcle itſelf is long. Its action inclines the neck forwards, and reſiſts the efforts which might tend to carry it backwards.

LONGUY, in *Geography*, a town of France, in the department of the Orne, and chief place of a canton, in the diſtrict of Mortagne; 9 miles E. of Mortagne. The place contains 1917, and the canton 7368 inhabitants, on a territory of 210 kiliometres, in 11 communes.

LONGUYON, a town of France, in the department of the Moſelle, and chief place of a canton, in the diſtrict of Briey; 7 miles S.W. of Longwy. The place, in which is a conſiderable iron forge and foundery of cannon, contains 1532, and the canton 9509 inhabitants, on a territory of 237½ kiliometres, in 26 communes. N. lat. 49° 27'. E. long. 5° 40'.

LONGWY, a town of France, in the department of the Moſelle, and chief place of a canton, in the diſtrict of Briey, ſituated on the Chiers. The place contains 2011, and the canton 10,743 inhabitants, on a territory of 242½ kiliometres, in 35 communes. This place was merely a village, ſurrounded with three ſharp mountains, on which was built, by Louis XIV. a new town, fortified by Vauban. N. lat. 49° 32'. E. long.

E. long. 5° 50′.—Alſo, a town of France, in the department of the Jura, on the Doubs; 9 miles S. of Dôle.

LONHANKO, a town of the Birman empire; 65 miles N. of Munchaboo.

LONICERA, in *Botany*, well known to every lover of Britiſh poetry by the name of Honeyſuckle, or Woodbine, received its name from Linnæus; the *Lonicera* of Plumier being a *Loranthus*. This name is intended to commemorate the merits of an old phyſician and naturaliſt, who lived during the middle of the ſixteenth century. Adam Lonicer, a phyſician at Frankfort, was born at Marburg, Oct. 10th, 1528, and died at the age of 58. He publiſhed two volumes folio, in Latin, upon the *Materia Medica*; and a German Herbal, with wooden cuts, which are occaſionally to be met with rudely coloured.—Few plants are more generally known, or admired, than ſeveral ſpecies of Honeyſuckle, whoſe beauty is only exceeded by the exquiſite delicacy of their fragrancy. Like the richeſt exotics they find a place in every one's fancy, and though as common as almoſt any other field or hedge plant, they have always been held in the greateſt eſtimation.—Linn. Gen. 93. Schreb. 128. Willd. Sp. Pl. v. 1. 982. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 260. Ait. Hort. Kew. ed. 2. v. 1. 377. Lamarck Illuſtr. t. 150. (Caprifolium; Tournef. t. 378. Juſſ. 219. Gærtn. t. 27.—Periclymenum; Tournef. t. 378.—Chamæceraſus; Tournef. t. 379.—Xyloſteon; Tournef. t. 379. Juſſ. 212.—Diervilla; Tournef. Act. 1706. t. 7. f. 1. Dill. Gen. App. 154. Juſſ. 211.—Symphoricarpos; Dill. Hort. Elth. 273. Juſſ. 211.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Aggregatæ*, Linn. *Caprifolia*, Juſſ.

Gen. Ch. *Cal.* Perianth ſuperior, five-cleft, ſmall. *Cor.* of one petal, tubular; tube oblong, gibbous; limb in five revolute ſegments, one of which is more deeply ſeparated. *Stam.* Filaments five, awl-ſhaped, about as long as the corolla; anthers oblong. *Piſt.* Germen inferior, roundiſh: ſtyle thread-ſhaped, the length of the corolla; ſtigma obtuſely capitate. *Peric.* Berry umbilicate, of two cells. *Seeds* roundiſh, compreſſed.

Obſ. The ſynonyms above quoted are all referred by Linnæus and ſucceeding writers to *Lonicera*, by whom the generic names of Tournefort and Dillenius are retained for the ſake of diſtinguiſhing the ſeveral ſpecies originally ſo called. We find the following remarks upon their differences in the *Genera Plantarum*.—*Caprifolium* has the lower ſegment of the limb ſeparated twice as deeply as the reſt, and the berries diſtinct.—*Periclymenum* has all the diviſions of the corolla equal; the berries alſo diſtinct.—*Chamæceraſus* has the lower diviſion of the corolla twice as deeply cut, with two berries ſeated upon the ſame baſe.—*Xyloſteon* has the diviſions of the corolla almoſt equally ſeparated, and two berries on the ſame baſe. In *Symphoricarpos*, the corolla is nearly bell-ſhaped; the fruit ſimple, two-celled, ſeeds ſolitary.

L. *alpigena* and *cærulea* are remarkable for having one germen for two florets, as in *Mitchella*.

Eſſ. Ch. Corolla of one petal, irregular. Berry inferior, of two cells, with ſeveral ſeeds.

Thirteen ſpecies of *Lonicera* are deſcribed in the *Species Plantarum* of Linnæus, ſixteen in the *Syſt. Veg.* ed. 14, and twenty by Willdenow. The genus is divided into three ſections, from which we have ſelected the following examples. Some of theſe ſections, as it will appear, comprehend, each of them, more than one of Tournefort's ſuppoſed genera.

Sect. 1. *Periclymena*, ſtem twining.

L. *Caprifolium*. Pale perfoliate Honeyſuckle. Linn. Sp. Pl. 246. Engl. Bot. t. 799. Jacq. Auſtr. t. 357.—Flowers ringent, whorled, terminal. Leaves deciduous; the uppermoſt united and perfoliate.—Firſt known as a native of this country from being found by the Rev. Mr. Relhan at Hinton near Cambridge. It flowers in May or June.—*Stem* ſhrubby, woody, twining. *Branches* nearly oppoſite, round, ſmooth. Almoſt all the *leaves* are combined, elliptical, obtuſe, entire, ſmooth, rather glaucous beneath; the upper ones in united perfoliate pairs, ſomewhat orbiculate, accompanying the flowers. *Flowers* in whorls, ſpreading, yellowiſh, with a fleſh-coloured tube, very fragrant. *Berries* of an orange red, crowned by the almoſt entire calyx.

L. *Periclymenum*. Common Honeyſuckle, or Woodbine. Linn. Sp. Pl. 247. Engl. Bot. t. 800. Curt. Lond. faſc. 1. t. 15. Fl. Dan. t. 908.—Heads of flowers ovate, imbricated, terminal. Leaves all ſeparate, deciduous. Corolla ringent.—Found almoſt univerſally in groves and hedges, flowering in June and July, occaſionally in the autumn.—*Stem* ſhrubby, woody, twining. *Branches* oppoſite, round. *Leaves* oppoſite, on very ſhort footſtalks, elliptical, entire, ſometimes pubeſcent, glaucous beneath. *Flowers* in a terminal head, ſpreading in a radiate manner, yellowiſh-white, and bluſh-coloured, very fragrant, and more particularly ſo early in the evening. *Berries* red, crowned with the five-toothed calyx, bitter, with a ſweetiſh flavour.—Dr. Smith obſerves that this ſpecies is liable to many variations in the different degrees of ſmoothneſs or hairineſs of its leaves, fruit, and younger branches; and that, by the coaſt, its flowers are often quite green.—A remarkable variety ſometimes occurs with ſinuated, variegated leaves, called the Oak-leaved Honeyſuckle.

Sect. 2. *Chamæceraſa*, Stalks bearing two flowers.

L. *Xyloſteum*. Upright Honeyſuckle. Linn. Sp. Pl. 248. Engl. Bot. t. 916.—Stalks two-flowered. Berries diſtinct. Leaves entire, downy.—Admitted as an Engliſh plant by Dr. Smith ſince the publication of his Flora, on the authority of Mr. W. Borrer, who found it “growing plentifully, and certainly wild, in a coppice called the Hacketts, to the eaſt of Houghton-bridge, four miles from Arundel, Suſſex.” It flowers in July.—*Stem* upright, buſhy, much branched. *Leaves* oppoſite, on footſtalks, ovate, clothed with ſoft hairs, deciduous. *Flowers* inodorous, in pairs, on ſolitary, axillary ſtalks, ſhorter than the leaves, yellowiſh-white, tinged with red, downy. *Berries* oval, red, containing ſix or more ſeeds.

L. *cærulea*. Blue-berried upright Honeyſuckle. Willd. n. 14. Pall. Roſſ. v. 1. p. 1. 58. t. 37. Jacq. Auſtr. App. t. 17.—Two flowers on a ſtalk. Berries united, globular. Styles undivided.—A native of Switzerland, Auſtria, Siberia, and the iſlands adjacent to America. It flowers in the ſpring.—*Stems* three or four feet high. *Branches* ſlender, covered with a ſmooth, purpliſh bark. *Flowers* white, two on a ſtalk. *Berries* of a beautiful blue colour, ſingle and diſtinct.—The wood of *L. cærulea* is very hard, and handſomely veined with grey and pale yellow. The juice of the berry ſtains paper of a ſtrong purple colour, and might perhaps be uſeful in dyeing.—The buds of this ſhrub ſtand three together, one above another, being provided for three years beforehand.

Sect. 3. Stem erect. Stalks many-flowered.

L. *Symphoricarpos*. Shrubby St. Peter's-wort. Linn. Sp. Pl. 249. (Symphoricarpos foliis alatis; Dill. Elth. 371. t. 278. f. 360.)—Heads of flowers lateral, on footſtalks. Leaves nearly ſeſſile.—A native of Virginia and Carolina, where it flowers in the autumn.—*Stem* about four feet high, ſending forth many ſlender *branches*. *Leaves* oppoſite, ovate. *Flowers* in whorls, round the ſtalk, ſmall, of a greeniſh colour. *Berry* hollow and fleſhy, containing cartilaginous, roundiſh *ſeeds*.

L. *Diervilla.* Yellow-flowered upright Honeyſuckle. Linn. Sp. Pl. 249. (Diervilla; Dill. Gen. App. 154. t. 10. Linn. Hort. Cliff. 63. t. 7.)—Heads of flowers terminal. Leaves ſerrated. A native of North America, and firſt introduced into Europe by M. Dierville, a French ſurgeon, whoſe name it ſtill commemorates. It flowers from May to September.—*Stem* about three feet high. *Bark* of a reddiſh colour. *Leaves* oppoſite, ſlightly ſerrated, pointed. *Flowers* ſmall, pale yellow, two or three together at each diviſion of the bunch. *Berries* oval, black, with one hard ſeed in each cell. They ſeldom, however, come to maturity in this country.

LONICERA, in *Gardening*, contains plants of the deciduous, flowering, ſhrubby, and evergreen kinds; of which the ſpecies moſtly cultivated are, the black-berried upright honeyſuckle (L. nigra); the Tartarian upright honeyſuckle (L. Tatarica); the fly honeyſuckle (L. xyloſteum); the Pyrenean upright honeyſuckle (L. Pyrenaica); the red-berried upright honeyſuckle (L. alpigena); the blue-berried upright honeyſuckle (L. cærulea); the ſhrubby St. Peter's-wort (L. ſymphoricarpos); the yellow-flowered upright honeyſuckle (L. diervilla); the common honeyſuckle (L. periclymenum); the Italian honeyſuckle (L. caprifolium); the trumpet honeyſuckle (L. ſempervirens); and the evergreen honeyſuckle (L. grata).

The ſecond ſort varies in ſhady groves, and other ſimilar ſituations, with white flowers.

And the ninth kind has ſeveral varieties, as the *late red*, which produces a greater variety of flowers together, than either the Italian or Dutch ſorts, making a finer appearance than either of them during the time of flowering; but it has not been ſo long cultivated as the latter. This was formerly termed the Flemiſh honeyſuckle.

There are alſo ſometimes varieties with ſtriped leaves.

The Dutch variety may be trained with ſtems, and formed into heads, which the wild ſort cannot, the branches being too weak and trailing for the purpoſe.

And there are two ſub-varieties of it, the *long blowing*, and the *late red*, in which the ſtems are ſtronger, the leaves, flowers, and heads of berries larger, and the corollas redder than in the woodbine ſort; the oak-leaved variety has ſinuate leaves, cut like the oak, but ſmooth.

And there is likewiſe a variety which has variegated leaves.

The tenth ſpecies has a yellow variety, in which the ſhoots are much ſimilar to it, but the bark darker in colour, the leaves of a deeper green, the flowers of a yellowiſh-red, appearing a little after it, being not of much longer duration, but are ſucceeded by red berries, containing one hard ſeed incloſed in the ſoft pulp in each, which ripens in the autumn.

And beſides this, ſome mention other varieties, ſuch as the early red-flowering, the late red-flowering, and the evergreen red-flowering.

Method of Culture.—An increaſe in all theſe plants may be effected either by layers or cuttings, but the latter is the better practice. The layers ſhould be made from the young ſhoots, and be laid down in the autumn or early ſpring, the ſtraggling tops being removed, when, by the following autumn, they will have taken root, and ſhould be cut off from the plants, being either planted where they are to remain, or into a nurſery to be trained for ſtandards, by fixing down ſtakes to the ſtem of each plant, to which the principal ſtalk ſhould be faſtened, all the others being cut off; training each of them to the intended height, when they ſhould be ſhortened to force out lateral branches, and theſe be again ſtopped to prevent their growing too long. By conſtantly repeating this as the ſhoots are produced, they may be formed into a ſort of ſtandard; but if regard is had to their flowering, they cannot be formed into regular heads, as the conſtant ſhortening will deſtroy the flower-buds, and prevent the deſired effect.

In reſpect to the cuttings, they ſhould be taken from the ſtrong ſhoots of the former ſummer, with three or four joints, and be placed in rows in a ſhady border, to the depth of two or three of them, a foot apart, and ſix inches from plant to plant. When they have taken good root in the autumn or ſpring following, they may be removed into the nurſery, and be planted out in rows two feet diſtant, and a foot aſunder in them, where they may be kept a year or two, till wanted for planting out where they are to remain.

The eighth ſort may be raiſed from ſuckers, which it affords in plenty, by taking them off, and planting them as above in the autumn in a rather moiſt ſoil.

Several of the ſorts may likewiſe be increaſed by ſowing the ſeed or berry in a bed of light mould in the autumn, to the depth of an inch. The plants riſe in the firſt or ſecond ſpring; and afterwards require the ſame management as the others.

In regard to their management afterwards, the only culture which any of them require, is, in the upright ſorts, to have their ſtraggling ſhoots ſhortened, and the dead wood cut out; and thoſe trained as climbers, to have their branches conducted in a proper manner upon their reſpective ſupports; and every year all rambling ſhoots reduced and trained as may be proper, ſo as to preſerve them within due limits and order, except where they are deſigned to run wild in their own rural way, eſpecially thoſe intended to climb among the branches of trees, ſhrubs, and buſhes; thoſe alſo intended to cover arbours and ſeats, ſhould be pruned and trained annually, laying the ſhoots along to their length, till they have covered the allotted ſpace; ſhortening or clearing out all ſuch ſtragglers as cannot be properly trained; alſo ſuch of thoſe ſorts as are trained againſt walls, &c. muſt have an annual pruning and training, by going over them two or three times in ſummer, laying in ſome of the moſt convenient proper ſhoots, ſome at their length, ſhortening or retrenching others, as neceſſary, to preſerve regularity, and the proper ſucceſſion of flowers; being careful to train enough, at this time, of ſuch as appear neceſſary to continue the bloom as long as poſſible; and in winter pruning, all thoſe left in ſummer, which may appear ſuperfluous or unneceſſary, ſhould be turned out, ſhortening all ſuch as are too long for the ſpace allotted for them, eſpecially all thoſe with weak ſtraggling tops, nailing in the remaining proper branches and ſhoots cloſe to the wall, or other ſupport which they may have.

They may all be introduced with propriety in plantations, both from the variety of their different growths, and the ornament and fragrance of their flowers; though the flowers of the upright kind are not ſo ſhowy as thoſe of the trailers; but they exhibit an exceedingly agreeable variety. But the trailing ſpecies have the greateſt merit, not only in their numbers, but ſize, elegance, and odour, as well as in their duration. The ſhrubs of all the ſorts are, notwithſtanding, proper to be introduced in ſhrubberies, the upright kinds to intermix as ſtandards. The trailing kinds, whoſe branches are great ramblers, and, without ſupport, trail along the ground, ſhould generally be introduced as climbers, having ſtout ſtakes placed to each of them to climb upon, which they effect by aſcending ſpirally round the ſupport, to a conſiderable height; and alſo be placed to aſcend round the ſtems of trees, and to climb among the boughs of the adjacent buſhes, ſhrubs, and hedges, which they effect in a very agreeable manner, by interweaving their branches with them. The climbers are likewiſe proper for training againſt walls and arbours, &c. for the ornament and fragrance of their flowers, laying their branches in, four or five inches aſunder; thinning out the ſuperabundant ſhoots annually, and training in ſome of the moſt robuſt for ſucceſſion wood, either at full length, or ſhortened, as moſt proper to fill the ſpace or vacancy that may be wanted to be covered.

The evergreen kinds are principally of the climbing tribe, and have much effect in their evergreen foliage, and the elegance of their flowers, as well as their long continuance in blow.

The uncommon beauty, and exquiſite fragrance of the flowers in the ninth ſpecies, entitle it to a place in moſt ſorts of plantations of the ornamental kind. In climbing, it turns from eaſt to weſt, in the manner of moſt of our climbing plants; and in common with them bears clipping and pruning well; as in a ſtate of nature, thoſe plants which cannot aſcend without the aid of others, are often liable to loſe great branches; they have conſequently a proportionate vigour of growth given them, in order to reſtore ſuch accidental damages. It is however ſubject, when planted near building, to be injured and disfigured by *aphides*, which are vulgarly termed *blights;* theſe inſects are not very numerous in the ſpring ſeaſon; but as the ſummer advances, they increaſe in a very rapid manner; their firſt attacks ſhould, of courſe, be carefully attended to, and the branches on which they firſt fix be cut off and deſtroyed, as when they have once gained ground they are defended by their numbers. Small plants may however be cleared of them by the uſe of tobacco duſt, or Spaniſh ſnuff, but this method is not practicable for large trees. The leaves of the plants are likewiſe liable to be punctured and curled up by a ſmall caterpillar, which produces a beautiful little moth, the phalæna tortrix. About the evening alſo, ſome ſpecies of ſphinges or hawk-moths are often ſeen to hover over the bloſſoms, and with their long tongues extract the honey from the very bottoms of the flowers.

LONICERUS, or Lonicer, John, in *Biography*, a learned German, was born in 1499: after having received a good education, he became himſelf a profeſſor at Marpurg, where he died about the year 1 ,60. He was author of a Greek and Latin Lexicon, and publiſhed an edition of Dioſcorides. Moreri.

LONIGO, or Leonico, in *Geography*, a town of Italy, in the Vicentin, ſeated on a river called Fiume Novo, and containing ſeveral churches and monaſteries; 14 miles S.S.W. of Vicenza.

LONKA, a town of Poland, in the palatinate of Podolia; 44 miles N. of Kaminiec.

LONSCHAKOVA, a town of Ruſſia, in the government of Irkutſk; 40 miles N.N.E. of Stretenſk.

LONSCHIN, a town of Pruſſia, in the palatinate of Culm; 10 miles S. of Culm.

LONS-LE-SAULNIER, a town of France, and principal place of a diſtrict, in the department of the Jura, formerly celebrated for its ſalt-works, but now diſcontinued. The place contains 6041, and the canton 14,999 inhabitants, on a territory of 112½ kiliometres, in 23 communes. N. lat. 46° 40′. E. long. 5° 38′.

LONTARUS, in *Botany*, Rumph. Amboin. v. 1. 45. t. 10. Juſſ. 39. Gærtn. t. 8, a barbarous name of Rumphius for the *Boraſſus flabelliformis* of Linnæus. See Borassus.

LONT-CHOUDSONG, in *Geography*, a town of Thibet; 35 miles N.N.E. of Laſſa. N. lat. 29° 58′. E. long. 92° 14′.

LONTHOIR, a town of the iſland of Banda, in the Eaſt Indian ſea.

LONTOU, a town of Africa, in Galam, on the Senegal; 60 miles S.E. of Galam.

LOO, a town of France, in the department of the Lys; ſix miles S.S.E. of Dixmude.

LOOBOE, or Loeboe. See Loeboe.

LOOCALLA, a town of Congo, on the Zaire; 90 miles W. of St. Salvador.

LOOCHRISTI, a town of France, in the department of the Scheldt, and chief place of a canton, in the diſtrict of Ghent. The place contains 3056, and the canton 14,432 inhabitants, on a territory of 140 kiliometres, in 7 communes.

LOODUERA, a town of Bengal; 11 miles S. of Rogonatpour.

LOOE, a ſmall iſland near the coaſt of Cornwall; two miles S.E. of Looe.

Looe, *Eaſt*, a borough and market town in the pariſh of St. Martin, hundred of Weſt, and county of Cornwall, England, is ſituated at the mouth of the river Looe, 12 miles from Plymouth, and 233 weſt from London. It is moſtly built on a flat piece of ground, having the river on the weſt, and the ſea on the ſouth. The ſtreets are narrow, and the houſes built with ſlate. The port is protected by a ſmall battery and breaſt-work. The town was incorporated by queen Elizabeth in 1587; the government is veſted in a mayor and nine burgeſſes, who jointly elect a recorder. Two members have been returned to parliament ever ſince 13 Elizabeth; the right of election is in the mayor, burgeſſes, and freemen; in number about fifty. In the ſurvey taken in 1801, Eaſt Looe was found to contain 126 houſes, and 467 inhabitants, who were chiefly ſupported by the pilchard fiſhery, and the trade connected with the port. Four annual fairs are held, and a weekly market on Saturdays. Beauties of England and Wales, vol. ii.

Looe, *Weſt*, originally named *Portpigham*, a borough and market town in the pariſh of Talland, hundred of Weſt, and county of Cornwall, England, is alſo ſituated at the mouth of the river Looe, and is connected with Eaſt Looe by a ſtone bridge of fifteen arches. Weſt Looe formerly was much more conſiderable in point of trade, &c. than Eaſt Looe; it now preſents a long ſtreet of mean irregular houſes, with a ſmall town-hall, anciently a chapel, and a few other buildings on the brink of the river. This borough, as well as the adjoining one, received its firſt charter of incorporation from queen Elizabeth, veſting the government in a mayor, and twelve burgeſſes, who with the freemen, in the whole about 50, elect two members of parliament. In the population return for 1801, Weſt Looe was ſtated to conſiſt of 82 houſes, and 376 inhabitants. A fair is held annually, and a market every Saturday. Beauties of England and Wales, vol. ii.

LOOF, or as it is uſually pronounced, *Luff*, a term uſed in conding of a ſhip. Thus,

Loof *up*, is to bid the ſteerſman keep nearer to the wind.

Loof *into a harbour*, is to ſail into it cloſe by the wind.

Loof, *to ſpring the*, or *luff*, is when a ſhip that was going large before the wind is brought cloſe by the wind.

When a ſhip ſails on a wind, that is, on a quarter-wind, they ſay to the ſteerſman, *keep your luff! veer no more! keep* *her to! touch the wind! have a care of the lee-latch!* All which words ſignify much the ſame thing, and bid the man at the helm to keep the ſhip near the wind.

Loof *of a ſhip*, denotes the after-part of a ſhip's bow; or that part of her ſide forward where the planks begin to be incurvated into an arch, as they approach the ſtem. Hence, the guns which lie here are called *loof-pieces*.

Loof-*hook*, in a *Ship*, a tackle with two hooks to it, one of which is to hitch into the crengle of the main and fore-ſail, and the other is to hitch into a certain ſtrap, which is ſpliced into the cheſs-tree, and ſo down the ſail. Its uſe is to ſuccour the tackles in a large ſail, that all the ſtreſs may not bear upon the tack. Sometimes alſo it is uſed when the tack is to be ſeized the ſurer.

Loof-*tackle*, or Luff-*tackle*, a large tackle, larger than the jigger-tackle, but ſmaller than thoſe which hoiſt the heavier materials into and out of the veſſel, ſuch as the main and fore tackles, the ſtay and quarter tackles, &c. ſerving to lift all the ſmall weights in or out of the ſhip, and otherwiſe variouſly employed as occaſion requires.

Loof, or *Loop*, a corn-meaſure at Riga, equal to 3978 cubic inches; of which 4324 are equal to ten Engliſh quarters.

LOOHOGGO, in *Geography*, one of the ſmaller Friendly iſlands, ſurrounded by a reef of rocks. S. lat. 19° 41′. E. long. 185° 36′.

LOOJAMA, a town on the E. coaſt of the iſland of Timor. S. lat. 8° 27′. E. long. 126° 18′.

LOOKING-Glass, a plain poliſhed glaſs ſpeculum, or mirror, to one ſide of which a plate of tin-foil is made to adhere by means of quickſilver; which being impervious to the light, reflects its rays, and ſo exhibits the images of objects placed before it.

In conſequence of this conſtruction, the looking-glaſs makes a double reflection of every object, *viz.* one from the upper ſurface, which is the weakeſt, and another from the under ſurface, which is contiguous to the tin-foil. When a perſon ſtands juſt before the glaſs, the two reflections coincide, and he perceives one image; but if he ſtands oblique, as at A, (*Plate* IX. *Optics*, *fig.* 10.) and views the reflection D, of an object B C, ſituated on the other ſide, he will then perceive two images, *viz.* one cauſed by the upper, and the other cauſed by the lower ſurface of the glaſs E F. If the object B C be very luminous, ſuch as a lighted candle, then the eye at A will perceive a great ſucceſſion of candles at D, gradually decreaſing in ſplendour; the cauſe of which phenomenon is, that the ſtrong reflection from the under ſurface of the glaſs is again reflected from the upper ſurface, and this again by the lower, &c.

The theory of looking-glaſſes, and the laws whereby they give the appearance of bodies, ſee under Mirror.

Looking-*glaſſes, the manner of grinding and preparing*, is as follows:—a plate of glaſs is fixed to a horizontal table of free-ſtone or wood, of about the ſame ſize, and cemented to it by Paris plaſter; and to another leſſer table is fixed in the ſame manner another plate. Over the firſt plate is ſprinkled fine ſand and water, in a ſufficient quantity for the grinding, and the ſecond or leſs plate is laid on it; and thus worked this way and that way, till each has planed the other's ſurface. Theſe plates are made to rub againſt each other evenly and ſteadily by a kind of hand-mill, the wheel of which is wrought by a man, or if the plates be large by two men, who regulate the preſſure as they think proper. As they begin to become ſmoother, finer ſand is ſucceſſively uſed. When one ſide of the plate is finiſhed, the plaſter that cemented it is picked off, and the plate turned, ſo that the other ſide may be ground in the ſame manner. Towards the cloſe of the operation of grinding, the preſſure is increaſed by loading the upper plates with flat ſtones of different thickneſſes. This proceſs laſts about three days, and it is of great importance that the ſurfaces ſhould be perfectly flat and parallel, which is determined by the ruler and plumb-line. In order to complete this proceſs, emery of different fineneſſes is uſed, and great care is taken in ſeparating and ſorting them. This is done by putting into a veſſel of water a quantity of rough emery, and well ſtirring it: the coarſeſt particles will ſink to the bottom, and the finer will be held ſuſpended for ſome time by the ſupernatant liquor. This liquor is poured off, and after ſome time, about 20 minutes, the finer particles will ſubſide. More water is then added to the veſſel, and the emery ſtirred again; and after remaining at reſt about 15 minutes, the ſupernatant liquor is poured off; and this by reſt furniſhes an emery of the ſecond degree of fineneſs. The ſame operation is repeated twice more at the different intervals of about five minutes and half a minute; by which two other ſorts are obtained. The wet emery obtained from all theſe liquors is ſeparably heated over a ſtove to evaporate the water, and when nearly dry, is made up into balls for the further operation. The plates are then ground on both ſides with two or three emerys, beginning with the coarſeſt, and finiſhed with great care. They are now perfectly even, and the ſcratches, which after the firſt operation remained and rendered them almoſt opaque, diſappear. (See Grinding.) For the method of poliſhing looking-glaſſes and mirrors, we refer to the article Polishing.

The plates being poliſhed, a thin blotting paper is ſpread on a table or marble ſlab; and ſprinkled with fine powdered chalk; and this done, over the paper is laid a thin lamina or leaf of tin, on which is poured mercury, which is to be equally diſtributed over the leaf, with a hare's foot or cotton. Over the leaf is laid a very thin ſmooth paper, of which the kind called fan-paper is beſt, and over that the glaſs plate. With the left hand the glaſs-plate is preſſed down, and with the right the paper is gently drawn out; which done, the plate is covered with a thicker paper, and loaden with a greater weight, that the ſuperfluous mercury may be driven out, and the tin adhere more cloſely to the glaſs. When it is dried, the weight is removed, and the looking-glaſs is complete.

Some uſe an ounce of mercury with half an ounce of marcaſite or biſmuth, melted by the fire; and left the mercury evaporate in ſmoke, pour it into cold water; and when cold, ſqueeze it through a cloth or leather. Some alſo add a quarter of an ounce of lead and tin to the marcaſite, that the glaſs may dry the ſooner. For more particular directions in the conduct of this operation, ſee Silvering.

In the Phil. Tranſ. N° 245, we have a method of *foliating* (ſee Foliating) globe looking-glaſſes, communicated by ſir R. Southwell. The mixture is of quickſilver and biſmuth, of each three ounces, and tin and lead, of each half an ounce; to the laſt throw in the marcaſite, and afterwards the quickſilver; ſtir them well together over the fire; but they muſt be taken off, and be towards cooling before the quickſilver be put to them. When the mixture is uſed, the glaſs ſhould be well heated, and very dry; but it will do alſo when it is cold, though beſt when the glaſs is heated.

Mr. Boyle's method, which he prefers to any which he ever met with in print, is this: take tin and lead, of each one part, melt them together, and immediately add of good tin-glaſs, or biſmuth, two parts; carefully ſkim off the droſs; then take the crucible from the fire, and before the mixture grows cold, add to it 10 parts of clear quickſilver, and having ſtirred them well together, keep the fluid in a new clean glaſs. When you are going to uſe it, firſt purge it by ſtraining it through linen, and gently pour ſome ounces into the glaſs to be foliated through a narrow paper funnel, reaching almoſt to the glaſs, to prevent the liquor from flying to the ſides. After this, by dextrouſly inclining the glaſs every way, endeavour to faſten it to the internal ſurface; which done, let it reſt for ſome hours; then repeat the ſame operation, and ſo continue at times, till the liquor is ſlowly paſſed over, and equally fixed to the whole ſuperficies; which may be diſcerned by expoſing the glaſs to the eye between that and the light. Boyle's works abr. vol. i. p. 129.

For the method of blowing and caſting glaſs, and the choice of the materials for looking-glaſſes, ſee Glass.

Looking-*Glaſs*, *Venus's*, in *Botany*. See Campanula.

LOOKNAPOUR, in *Geography*, a town of Hindooſtan, in Oude; 15 miles S.W. of Kairabad.

LOOK-OUT, Cape, a cape on the coaſt of North Carolina, being the ſouthern part of a long, inſulated, and narrow ſtrip of land, E. of Core Sound. Its N. point forms the S. ſide of Ocrecoch inlet, which leads into Pamlico Sound; N.E. of Cape Fear, and S. of Cape Hatteras, in about N. lat. 34° 50′. Its excellent harbour has been filled up with ſand ſince the year 1777.—Another cape, of the ſame name, lies on the ſouthern coaſt of Hudſon's bay, in New South Wales, E.S.E. of the mouth of Severn river. N. lat. 56°. W. long. 84°.

Look-out, in *Sea Language*, denotes a watchful attention to ſome important object, or event, which is expected to ariſe from the preſent ſituation of a ſhip, &c. It is principally uſed when there is a probability of danger from the real or ſuppoſed proximity of land, rocks, enemies, &c. There is always a look-out kept on a ſhip's forecaſtle at ſea, to watch for any dangerous objects lying near her track; the mate of the watch accordingly calls often from the quarter deck, *look out afore there!* to the perſons appointed to this ſervice. Falconer.

LOOKSEENGAH, in *Geography*, a town of Bengal; 35 miles N.W. of Ramgur.

LOOL, in *Metallurgy*, a veſſel made to receive the waſhings of ores of metals. The heavier or more metalline parts of the ores remain in the trough to which they are waſhed; the lighter, and more earthy, run off with the water, but ſettle in the lool.

LOOM, in *Geography*, a town of Norway; 60 miles S.E. of Romſdal.

Loom, the weaver's frame; a machine whereby ſeveral diſtinct threads are woven into one piece.

Looms are of various ſtructures, accommodated to the various kinds of materials to be woven, and the various manners of weaving them; *viz.* for woollens, ſilks, linens, cottons, cloths of gold; and other works, as tapeſtry, ribbands, ſtockings, &c. divers of which will be found under their proper heads. See Weaving.

The weaver's loom-engine, otherwiſe called the Dutch loom-engine, was brought into uſe from Holland to London, in or about the year 1676.

Loom, *Heir*, in *Law*. See Heir-*Loom*.

Loom, at *Sea*. If a ſhip appears big, when at a diſtance, they ſay ſhe looms, or appears a great ſail; the term is alſo uſed to denote the indiſtinct appearance of any other diſtant objects.

The moſt remarkable phenomena of this kind, depend on the accidental variations of the temperature of the air at different parts, producing great irregularities in its refraction, eſpecially near the horizon. Accordingly the rarefaction of the air in the neighbourhood of the ſurface of water, of a building, or of the earth itſelf, occaſions a diſtant object to appear depreſſed inſtead of being elevated, and to be ſometimes ſeen at once both depreſſed and elevated, ſo as to appear double, one of the images being generally in an inverted poſition, as if the ſurface poſſeſſed a reflective power; and there ſeems to be a conſiderable analogy between this kind of refraction and the total reflection which happens within a denſer medium. See Fata *Morgana*.

Loom-*Gale*, a gentle, eaſy gale of wind, in which a ſhip can carry her top-ſails a-trip.

LOOMAKA, in *Geography*, a town of Bootan; 28 miles S. of Taſſaſudon.

LOON, in *Ornithology*. See Colymbus *glacialis*, and Colymbus *Auritus*.

LOONENBURG, in *Geography*, a town of Green county, New York, near the city of Hudſon.

LOONGHEE, a town of the Birman empire, on the Irawaddy, which has a celebrated temple; 55 miles N. of Prome. N. lat. 19° 42′.

LOONPOUR, a town of Hindooſtan, in Guzerat; 40 miles E. of Junagur.

LOOP, in the *Iron Works*, is a part of a ſow or block of caſt iron broken or melted off from the reſt, and prepared for the forge or hammer. The uſual method is, to break off the loop of about three quarters of a hundred weight. This loop they take up with their flinging-tongs, and beat it with iron ſledges upon an iron-plate near the fire, that ſo it may not fall to pieces, but be in a condition to be carried under the hammer. It is then placed under the hammer, and a little water being drawn to make the hammer move but ſoftly, it is beat very gently, and by this means the droſs and foulneſs are forced off, and after this they draw more and more water by degrees, and beat it more and more till they bring it to a four-ſquare maſs, of about two feet long, which they call a bloom.

Loop, in *Rural Economy*, the hinge of a door or gate. See Gate.

Loop-*Holes*, in *Sea Language*, are holes made in the coamings of the hatches of a ſhip, to fire muſkets through in a cloſe fight.

LOOPHEAD, in *Geography*, a cape of Ireland, in the county of Clare, being the north point of the mouth of the Shannon. On this headland is a lighthouſe. N. lat. 52° 30′. W. long. 9° 50′.

LOOPING, in *Metallurgy*, a word uſed by the miners of ſome counties of England, to expreſs the running together of the matter of an ore into a maſs, in the roaſting, or firſt burning, intended only to calcine it ſo far as to make it fit for powdering. This accident, which gives the miners ſome trouble, is generally owing to the continuing of the fire too long in this proceſs.

LOOSA, in *Botany*, a name which originated with Adanſon, but of whoſe meaning or derivation we find no account, except that it has been ſuppoſed intended to commemorate ſome Spaniſh botaniſt, of whoſe merits or name nothing elſe is known. Adanſon writes it *Loaſa*, and he is followed by Jacquin and the French botaniſts. Linnæus, Murray and Schreber uſe the above orthography, which we have retained, though we much ſuſpect it to have been originally an error of the preſs; but having nothing better to guide us, we leave matters as we find them. It is pity ſo fine a genus ſhould not have a certain or intelligible appella-

tion. Linn. Syſt. Nat. ed. 12. v. 2. 364. Syſt. Veg. ed. 14. 494. Schreb. 360. (Loaſa; Adanſ. v. 2. 501. Jacq. Obſ. faſc. 2. 15. t. 38. Willd. Sp. Pl. v. 2. 1176. Mart. Mill. Dict. v. 3. Juſſ. 322. Lamarck Dict. v. 3. 758. Loaza; Lamarck Illuſtr. t. 426.)—Claſs and order, *Polyandria Monogynia*. Nat. Ord. *Onagris affine*, Juſſ.

Gen. Ch. *Cal.* Perianth almoſt entirely ſuperior, of five lanceolate, ſpreading, permanent, equal leaves. *Cor.* Petals five, large, obovate, hooded, ſpreading, equal, attenuated at their baſe into ſlender claws. Nectary of five leaves, alternate with the petals, approximated in the form of an acute cone, each rather ſhorter than the petals, lanceolate, corrugated, awned with a double briſtle. *Stam.* Filaments numerous, capillary, in parcels of from 15 to 17 oppoſite to each petal, longer than the nectary; anthers incumbent, roundiſh. *Piſt.* Germen ſomewhat ovate, more than half inferior; ſtyle thread-ſhaped, erect, the length of the ſtamens; ſtigma ſimple, obtuſe. *Peric.* Capſule turbinate, of one cell, opening with three valves at the top, which are half-ovate, acute, finally ſpreading. *Seeds* numerous, ovate, ſmall. *Receptacles* three, linear, longitudinal.

Eſſ. Ch. Calyx of five leaves. Petals five. Nectary of five leaves alternate with the petals. Capſule half-inferior, of one cell, three valves at the top, and many ſeeds.

Obſ. This genus is, as Jacquin obſerves, nearly akin to *Mentzelia*.

1. L. *hiſpida*. Lamarck t. 426. fig. 1. (L. urens; Jacq. Obſ. faſc. 2. 15. t. 38.)—Very briſtly. Leaves alternate, doubly pinnatifid. Edges of the calyx-leaves revolute. Gathered by Dombey, in ſandy ground in Lima. The *root* is annual, fibrous. *Stem* erect, from one to three feet, or more, in height, ſlightly ſubdivided, leafy, round, beſet with innumerable, horizontal, tawny, briſtles, which are obſervable, more or leſs, in all the ſpecies. Lamarck has found each of theſe briſtles to be furniſhed with a ſlight bag at its baſe, and thence he reaſonably concludes that the plant ſtings like a nettle, whoſe venom is lodged in ſimilar bags. Theſe ſtings are, in the plant we are deſcribing, intermixed with fine down. *Leaves* alternate; the lower ones ſtalked; the reſt ſeſſile; all doubly pinnatifid, more or leſs deeply, two or three inches long, ſomewhat briſtly, downy beneath; their diviſions and teeth irregular and obtuſe. *Flower-ſtalks* ſcattered, generally oppoſite to the leaves, ſolitary, ſimple, ſingle-flowered, briſtly, above an inch long, deſtitute of bracteas. *Flowers* large, handſome and very remarkable, above an inch wide. *Petals* yellow, briſtly on the outſide, concave. *Nectaries* white, dotted with red and green. *Stamens* at firſt erect, then lying in five tufts upon the petals, conſpicuous for their dark anthers. This plant dries remarkably well, and has the appearance of being very ſhowy when growing. We never heard of this or any other ſpecies being cultivated in Europe, but they would doubtleſs ſucceed with the ſame treatment as the *Calceolaria pinnata*.

2. L. *contorta*. Lamarck n. 2. t. 426. fig. 2.—Stem twining. Leaves oppoſite, ſtalked, ſomewhat runcinate, toothed. Capſule twiſted.—Gathered by Joſeph de Juſſieu in Peru. One of his ſpecimens is figured and deſcribed by Lamarck, with a weak twining *ſtem*, two feet or (probably) much more in height, moderately briſtly. *Leaves* oppoſite, ſtalked, about three or four inches in length, pinnatifid, briſtly, ſharply toothed or cut, their loweſt pair of lobes longeſt and moſt reflexed. *Flowers* on long axillary ſimple ſtalks, yellow.

3. L. *acanthifolia*. Lamarck n. 3. (Ortiga chilienſis urens, acanthi folio; Feuill. Peruv. v. 2. 757. t. 43.)—Leaves oppoſite, pinnatifid, ſharply toothed; the upper ones ſeſſile. Calyx reflexed. Petals with two terminal teeth. Gathered by Feuillée in a valley in Chili. *Stem* ſix feet high, briſtly, branched, hollow. *Leaves* oppoſite, reſembling thoſe of *Argemone mexicana*, nine or ten inches long, and ſix broad, deeply pinnatifid, with numerous, ſharp, briſtly teeth; the lowermoſt ſtalked, the reſt ſeſſile. *Flowers* large, ſtalked as in the foregoing; their *petals* dark-green and briſtly at the outſide, bright red within; *nectary* yellow, ſtriped with red. No one but Feuillée ſeems to have known this remarkable ſpecies.

4. L. *grandiflora*. Lamarck n. 4.—"Leaves oppoſite or alternate, ovate, ſomewhat heart-ſhaped, lobed; hoary beneath. Petals flattiſh."—Gathered by Joſeph de Juſſieu in Peru. We have never ſeen a ſpecimen of this. Lamarck deſcribes it as remarkable at firſt ſight for the glaucous hoarineſs of the under-ſide of its *leaves*, and the great ſize of its *flowers*, which, when expanded, are at leaſt three inches broad. The *herb* is very briſtly. *Leaves* about three and a half inches long, two and a half wide.

5. L. *chenopodifolia*. Lamarck n. 5.—Leaves ſcattered, ſtalked, ovate, cut and toothed. Flowers drooping, in terminal, ſimple, ſomewhat leafy, cluſters. Fruit oblong, very briſtly. Gathered in Peru, by Joſeph de Juſſieu, whoſe ſpecimens were deſcribed by Lamarck. We have one gathered in moiſt ſituations in Lima, by Dombey. The *root* is fibrous and annual, as, probably, in the whole genus. *Stem* 12 to 15 inches high, erect, ſlightly branched, roughiſh with deflexed hairs. *Leaves* an inch or two long, one broad, few, ovate, bluntly pointed, variouſly toothed, rough with ſmall denſe briſtles. *Flowers* drooping, in a long, looſe, terminal cluſter, with a few ſmall leaves about its lower part, rather ſmall, yellow; the nectary apparently reddiſh. *Fruit* oblong, pendulous, beſet with long, prominent, denſe, rigid briſtles.

6. L. *nitida*. Lamarck n. 6.—Stem procumbent. Leaves oppoſite, palmate, cut and toothed; ſhining above; downy beneath. Fruit turbinate, briſtly. Gathered by Dombey in ſtony ground in Lima. The *ſtem* appears to be weak and procumbent, forked, leafy, downy, leſs briſtly than in ſome of the former. *Leaves* palmate, heart-ſhaped and three-ribbed at the baſe, variouſly jagged and toothed; nearly ſmooth and ſhining above, finely downy beneath; with a few ſcattered briſtles on both ſides. The lower leaves ſtand on downy *ſtalks*; the upper are nearly or quite ſeſſile. *Flower-ſtalks* from the forks of the ſtem, rather long, downy. *Germen* turbinate, downy, clothed with reflexed briſtles, but far leſs denſely than the laſt-deſcribed. *Calyx-leaves* broad and large. Dombey ſays, "the nectaries are very ſmall, three-cleft and white, with three purple briſtly-pointed appendages, on the outſide, at their baſe."

Specimens of theſe two laſt, gathered by him, are preſerved in the Linnæan herbarium.

LOOSE, To, in *Sea Language*, is to unfurl or caſt looſe any ſail, in order to be ſet, or dried, after rainy weather.

Loose-*Strife*, in *Botany*. See Lysimachia.

Loose-*ſtrife*, *Podded*. See Willow-*herb*.

Loose-*ſtrife*, *Purple and Spiked*. See Lythrum.

Loose-*ſtrife*, *Virginian*. See Gaura.

Loose *Style*. See Style.

LOOSEDRECHT, in *Geography*, a town of Holland; 8 miles S. of Naarden.

LOOSEMORE, Henry, in *Biography*, a bachelor of muſic in the univerſity of Cambridge, 1640, and organiſt, firſt of King's college, and afterwards of the cathedral of Exeter. He compoſed ſeveral ſervices and anthems, *ex officio*,

officio, for theſe choirs; but we believe they were never printed, or adopted elſewhere. A perſon of the ſame name, a lay ſinger or organiſt of Exeter cathedral, is ſaid to have built the organ, which was erected in that church at the reſtoration; of which inſtrument, the largeſt pipe of the open diapaſon was 32 feet; which exceeded in magnitude that of any other organ in the kingdom.

LOOSEMORE, GEORGE, bachelor in muſic, of Trinity college, Cambridge. *Great* muſicians are but few in every part of Europe, except Italy and Germany, where the courts and capitals are ſo numerous; but *mediocrity* produces many muſicians everywhere.

LOOSENED. See Hoof-*looſened.*

LOOT, a weight in Holland, 32 of which are equal to 1lb. of commercial weight, and 24 = 1lb. of apothecaries' weight = ¾lb. troy.

LOP, in *Rural Economy*, a term ſignifying to prune or cut away.

LOP *Kent-chian*, in *Geography*, a mountain of Thibet. N. lat. 30° 14'. E. long. 85° 54'.

LOPARY, a town of Hindooſtan, in Benares; 10 miles S. of Jionpour.

LOPES, FERNAM, in *Biography*, the moſt ancient of the Portugueſe chroniclers, and ſaid to be one of the beſt writers of chronicles that any country can boaſt. He was private ſecretary to the infante D. Fernando, who died in captivity at Fez, afterwards became chief chronicler, and keeper of the archives. He died in 1449. He was author of the chronicles of Pedro I., of Fernando, and of Joam I. to the concluſion of peace with Caſtile. The chronicles of the earlier kings are variouſly attributed to him, or to Ruy de Pina, in whoſe name they are publiſhed. The chronicle of Pedro was edited in 1734 by P. J. P. Bayam, and was reprinted in 1760. That of Fernando, which is longer and more valuable, has never been publiſhed. A manuſcript copy of the work is in the hands of Mr. Southey. The moſt important of all his writings is his chronicle of Joam, which is the hiſtory of the grand ſtruggle between Portugal and Caſtile, towards the cloſe of the fourteenth century. "No pains," ſays the biographer, "were ſpared to render it as complete as poſſible, neither on the part of the hiſtorian himſelf, nor of the king Duarte, by whoſe command this hiſtory of his father was written. The monarch ſent into Caſtile to collect documents, and the chronicler, independently of the information which he had received at court from perſons who had borne a part in the councils and actions of thoſe times, went over the whole kingdom to collect teſtimony from all the actors in the wars, which he recorded. This was firſt publiſhed in 1644, ſoon after the Braganzan revolution; never was a publication better timed; never was any book better calculated to rouſe a nation by the example of their fathers, and encourage them to reſiſt thoſe enemies whom their fathers, under like circumſtances, had conquered. It is a truly excellent and admirable work. With the great advantage of ſingleneſs and wholeneſs of ſubject, it has all the manners, painting, and dramatic reality of Froiſſart, conveyed in a nobler language, and vivified by a more patriotic and more poetical mind." Gen. Biog.

LOPESCO, in *Geography*, a town of Naples, in Abruzzo Ultra; 19 miles S.W. of Aquila.

LOPEZ, GREGORIO, in *Biography*, a celebrated Spaniſh lawyer, was born at Guadaloupe, towards the cloſe of the fifteenth, or commencement of the ſixteenth century. He edited the laws of Alonſo the Wiſe, known by the title of "Las Siete Partidas," and added a commentary, which has been retained in moſt of the ſubſequent editions, and is included in the laſt. Lopez ſtudied at Salamanca, and was one of the royal council of the Indies. The time of his death is not known: his epitaph in St. Anne's chapel, in the monaſtery of Guadaloupe, ſays, in the Portugueſe language:

"Here lies the licentiate Gregorio Lopez, a native of this place. Pray to God for him." Gen. Biog.

LOPEZIA, in *Botany*, dedicated by Cavanilles to the memory of "the Licentiate Thomas Lopez," a native of Burgos, who had an honourable appointment in America in the reign of the emperor Charles V., and is ſaid to have written a compendium of natural hiſtory, after his return; which ſtill remains in manuſcript, under the title of a Treatiſe on the three elements of air, water and earth. Cavan. Ic. v. 1. 12. Vahl. Enum. v. 1. 3. Willd. Sp. Pl. v. 1. 18. Ait. Hort. Kew. ed. 2. v. 1. 10. Lamarck Dict. v. 3. 594.—Claſs and order, *Monandria Monogynia.* Nat. Ord. *Onagræ*, Juſſ. See Sims and Konig's Annals of Botany, v. 1. 532.

Gen. Ch. *Cal.* Perianth ſuperior, of four oblong, concave, coloured deciduous leaves; three of them aſcending; the fourth, rather the largeſt, pointing downwards. *Cor.* irregular. Petals four, ſpreading, longer than the calyx; the two uppermoſt oblong, erect, parallel, with a gland at the baſe, and ſupported by cylindrical claws; two lateral ones ſpatulate, widely ſpreading. Nectary obovate, folded, on a bent elaſtic ſtalk, parallel to the lower leaf of the calyx. *Stam.* Filament one, awl-ſhaped, aſcending, oppoſite to the nectary half as long as the upper petals; anther terminal, ovate, ſimple, of two cells, embraced in an early ſtate, by the folded limb of the nectary. *Piſt.* Germen inferior, nearly globoſe, ſmooth; ſtyle thread-ſhaped, ſomewhat declining, as long as the ſtamen; ſtigma capitate, downy. *Peric.* Capſule globular, of four cells, opening at the top by four valves. *Seeds* minute, ovate, numerous. *Receptacle* ſquare.

Eſſ. Ch. Calyx ſuperior, of four unequal leaves. Corolla irregular, of four petals. Nectary ſtalked, folded, oppoſite to the ſtamen. Capſule of four cells and four valves. Seeds numerous.

1. L. *hirſuta.* Hairy Lopezia. Dryandr. in Ait. Hort. Kew. n. 1. Jacq. Coll. Suppl. v. 5. t. 15. f. 4. (L. mexicana β; Willd. Sp. Pl. n. 1.)—Leaves ovate, downy. Stem round, hairy.—Native of Mexico. Mr. John Hunnemann obtained ſeeds from Germany, for Kew garden, in 1796. The plant is annual, kept in the ſtove, and flowers from September to November. We procured ſpecimens in 1797 from the Cambridge garden. The *ſtem* is two or three feet high, branched, pale green, clothed with longiſh ſoft hairs. *Leaves* alternate, ſtalked, ovate, pointed, minutely toothed, an inch or an inch and half long, of a bright light green, clothed on both ſides with ſhort ſoft hairs; thoſe near the flowers ſmall and ſeſſile. *Cluſters* ſolitary at the end of every little branch, ſomewhat corymboſe, leafy; their partial ſtalks capillary, ſimple, ſpreading, coloured, ſmooth. *Flowers* ſpreading, prettily variegated with pink, deep red, and white, in ſhape not unlike ſome ſort of little flies. When touched, they exhibit a ſtriking elaſticity, if not irritability, in the manner in which the nectary on one hand, and the ſtamen on the other, fly from the piſtil.

2. L. *racemoſa.* Smooth Lopezia. Cavan. Ic. v. 1. 12. t. 18. Curt. Mag. t. 254. (L. mexicana α; Willd. Sp. Pl. n. 1.)—Stem ſquare, ſmooth, as well as the leaves. Floral leaves minute.—Native of Mexico. The firſt ſeeds that arrived in this country, were ſent in a letter from Madrid in 1791, by the Abbé Cavanilles to the writer of the preſent article, and produced plants at Kew and Chelſea the follow-

ing year, which bloomed abundantly in the autumn, and were much admired. This ſpecies differs from the former chiefly in its ſmoothneſs, and the ſquareneſs of its *ſtem*. In other reſpects they are very much alike, eſpecially in the *flowers* and infloreſcence, ſo as to have been generally thought varieties. We are indeed by no means certain, that the ſtem of the *hirſuta* is not frequently angular, in ſome degree.

3. L. *coronata*. Coronet-flowered Lopezia. Andr. Repoſ. t. 551. Dryandr. in Ait. Hort. Kew. n. 3.—Leaves ſmooth and ſhining. Stem angular, from the decurrent footſtalks. Floral leaves moſtly longer than the flower-ſtalks.—Native of Mexico. Meſſrs. Lee and Kennedy are ſaid to have introduced this ſpecies in 1805, which is marked as a hardy annual in Hort. Kew. It differs from the laſt in being of more luxuriant growth, with larger floral *leaves*, the whole foliage being of a deeper more ſhining green. We are much inclined to ſuſpect theſe differences to have ariſen from differences of treatment, and that the fading of the lateral petals, as they advance in age, may be attributed to the action of ſtrong ſunſhine. S.

LOPHANTHUS, from λοφος, *a creſt*, and ανθος, *a flower*, is the ſpecific name of a ſpecies of *Hyſſopus*; ſee that article. Forſter has uſed it to deſignate a genus of his own, in his *Genera Plantarum*, of the native country of which, or of its form, habit, or duration, he has ſaid nothing, except that it is next akin to *Waltheria*; neither does any mention of it occur, as far as we can find, in his ſubſequent works. We preſume therefore he found he had made a miſtake, but we ſubjoin his characters of the genus. Forſt. Gen. t. 14. Juſſ. 427. Lamarck Dict. v. 3. 594. Illuſtr. t. 143.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Columniferæ*, Linn.? *Incertæ ſedis*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, in five ſmall, equal, acute ſegments, permanent. *Cor.* Petals five, ſpatulate, ſpreading, roundiſh, with ſlender upright claws the length of the calyx. *Stam.* Filaments five, awl-ſhaped, the length of the corolla; anthers ſomewhat incumbent. *Piſt.* Germen ſuperior, oblong, conical, hairy; ſtyle ſhort, cylindrical, nipple-like, ſlightly club-ſhaped; ſtigma ſlightly cloven. *Peric.* of one cell, clothed with long hairs. *Seed* ſolitary, ovate, covered, ſmooth, in the bottom of the calyx.

1. L. *tomentoſus*. The only ſpecies mentioned.

LOPHIA, in *Anatomy*, a term for the upper part of the cervix, or back part of the human neck.

LOPHIUS, in *Natural Hiſtory*, a genus of fiſhes of the order Branchioſtegi: the generic character is as follows: head depreſſed; many ſharp-pointed teeth; tongue broad and armed with teeth; eyes on the upper part of the head; noſtrils ſmall; gills three; one lateral aperture; pectoral fins placed on the long branchiæ; dorſal and anal fins oppoſite, and near the tail; body ſcaleleſs, covered with a thin lax ſkin; vent in the middle; no lateral line. The fiſhes of this genus are of a ſingularly uncouth appearance; the body being thick and ſhapeleſs; the head exceſſively large, and the fins ſhort and broad.

Species.

PISCATORIUS. This has various Engliſh names, as the European or common angler, frog-fiſh, toad-fiſh, fiſhing-frog, ſea-devil, &c. Body depreſſed; head rounded. The uſual length of this ſpecies is from two to four feet, though it is ſometimes found ſix or even ſeven feet long. In its form it has a reſemblance to that of a tadpole. The ſkin of the trunk is ſmooth, but that of the upper parts marked by various inequalities. The eyes are large and whitiſh; the lower jaw is conſiderably longer than the upper. There are ſome thread-like proceſſes that proceed from the upper part of the head, and ſome ſhorter ones from the back, but the edges of the body are fringed at intervals with ſhorter appendages of a ſomewhat ſimilar nature. The upper ſurface is brown, with deeper or paler variegations, and the under ſurface is whitiſh. The frog-fiſh inhabits the European ſeas; ſwims ſlowly; lies in ambuſh, in ſhallows, half-concealed by ſea-plants or mud, and decoying its prey by moving its worm-like proceſſes. According to the deſcription given by Buffon the two long beards or filaments placed immediately above the noſe are ſmall in the beginning, but thicker at the end, and anſwer the very ſingular purpoſe of a fiſhing-line, to which uſe the animal converts them. This property of thoſe filaments is referred to by Pliny and other naturaliſts, who ſay, "with theſe extended, the fiſhing-frog hides in muddy waters, and leaves nothing but the beards to be ſeen: the curioſity of the ſmaller fiſh brings them to view theſe filaments, and their hunger induces them to ſeize the bait; upon which the animal in ambuſh inſtantly draws in its filaments with the little fiſh that had taken the bait, and devours them without mercy." It is ſaid if the bowels of the fiſhing-frog are taken out the body will appear tranſparent; and if a lighted candle be ſubſtituted for the inteſtines, as in a lanthorn, the whole has a very formidable appearance. This ſpecies feeds on dog-fiſh and other ſmaller fiſhes. The "cornubienſis," or corniſh, or long-angler, or fiſhing-frog of Mount's bay, which has been taken as a ſeparate ſpecies, may be regarded only as a variety.

BARBATUS. Body depreſſed; lower jaw bearded. It inhabits the ſeas of Northern Europe; is between three and four feet long, and is a very voracious fiſh.

VESPERTILIO. Body depreſſed; head roſtrate: an inhabitant of the American ocean; the body is reddiſh, broad before, narrowed behind, and covered with radiate, ſharp, patelliform tubercles; beneath with ſmall prickles; in its mode of catching its prey it reſembles the L. piſcatorius.

HISTRIO; Harlequin angler, or American toad-fiſh; is of a compreſſed form; of a yellowiſh-brown colour, with irregular blackiſh ſpots, and beards on the head and body. This, which is one of the moſt groteſque and ſingular of fiſhes, is found in the American and Indian ſeas, and is a moſt curious and remarkable fiſh. It is about a foot long, and its ventral fins reſemble ſhort arms. It has been aſſerted, though on very doubtful authority we ſuſpect, that inſtances have been known of theſe fiſhes living three days without water.

STRIATUS. Body compreſſed, brown; marked all over with numerous black ſtreaks; is found on the coaſt of New Holland.

PICTUS. Body compreſſed, brown, with yellowiſh blotches edged with red; inhabits the ſouthern ocean; tendril on the noſe forked at the end.

MARMORATUS. Body ſubcompreſſed, livid, varied with whitiſh and ferruginous ſpots, dorſal fin ſingle; tendril at the noſe three-cleft at the end. Native of the Pacific ocean; obſerved about the coaſt of Otaheite, &c.

MONOPTERIGIUS. Body depreſſed, blackiſh, beneath whitiſh; fin above the tail almoſt erect, ramoſe. It inhabits the ſeas of Auſtralaſia. It is not quite agreed where to place this very ſingular fiſh; it has no fin except the lobate one juſt above the tail; the eyes are vertical, approximate, and far behind the ſnout: the body is roundiſh, a little tapering to both ends, and the tail at the end of the body rounded.

MURICATUS; Depreſſed angler: deſcribed firſt by La

Cepede, under the name "Lophie faujas:" body flat, orbicular, and covered with numerous ſmall tubercles tipped with divided or radiated ſpines; hind part contracting ſuddenly, covered with ſimilar ſpines, and terminated by the tail fin, which is of a moderate ſize, and ſlightly rounded; pectoral fins large, and ſituated lower than thoſe in the common angler. It is about four inches in length.

LOPO, in *Geography*, a lake of Thibet, about 18 miles long and nine broad. N. lat. 42° 20'. E. long. 89° 52'.

LOPPED Milk, in *Rural Economy*, ſuch as has ſtood till it becomes ſour and curdled.

LOPPEN, in *Geography*, a ſmall iſland in the North ſea, near the coaſt of Lapland. N. lat. 69° 43'.

LOPPING, in *Rural Economy*, the operation of cutting off the lateral or other branches of trees. Moſt old trees are found hollow within, which frequently proceeds from the fault of thoſe who have the management of them, by ſuffering the tops to grow too large before they are lopped; and this is common in the aſh, elm, hornbeam, &c. It is done in order to have more great wood; but the cutting off great tops often endangers the life of the trees, or wounds them, ſo that they yearly decay more in their bodies than the annual value of the tops; hence it is to the loſs of the owner to have them ſo managed; and though the hornbeam and elm will bear great tops, when the body is little more than a ſhell, the aſh, when it comes to take wet at the head, and decays, rarely bears any more top. When timber trees of this kind begin to decay, they ſhould be cut down as ſoon as poſſible.

But the lopping of trees at ten or twelve years old, in general, preſerves them much longer, and occaſions the ſhoots to grow more into wood in one year than they do in old tops in two or three. As great boughs, ill taken off, ſpoil trees, they ſhould always be taken off cloſe and ſmooth, and not in a ſlanting manner, as is a common practice. The wood ſhould be covered with loam and horſe-dung mixed, or ſome of Mr. Forſyth's compoſition, to prevent the wet from entering the bodies of the trees, and deſtroying them by bringing on the rot.

When trees are at full growth, the ſigns of their decay are the withering or dying of many of their top branches, and the wet entering at ſome knots, or their being otherwiſe hollow or diſcoloured; alſo by their making but poor ſhoots, and the woodpeckers making holes in them.

The above method of lopping of trees is only, however, proper for pollard-trees; nothing being more injurious to the growth of timber trees than lopping or cutting off great branches from them. Miller obſerves, that whoever will be at the trouble of trying the experiment upon two trees of equal age and ſize, growing near each other, by lopping or cutting off the ſide branches from one of them, and ſuffering all the branches to grow upon the other, will in a few years find the latter to exceed the former in growth in every way, and not decay nearly ſo ſoon.

It is generally recommended not to prune timber trees at all; and, where they naturally grow ſtraight and regular, they are much better let alone. But all common faults in ſhape may be regulated by lopping them while young, without any ill conſequences to the timber.

The very large foreſt trees ſhould not be lopped at all, except in caſes of great neceſſity, and then only the ſide branches ſhould be removed, which muſt be done as cloſe to the trunk as poſſible. The moſt proper ſeaſons for the performance of this ſort of buſineſs are thoſe of the very early autumn and ſpring months, in moſt inſtances.

It may be obſerved that moſt ſorts of reſinous trees, or ſuch as abound with a milky juice, ſhould be lopped very ſparingly, as they are ſubject to decay when often lopped, or cut over in their branches. The beſt ſeaſon for lopping thoſe kinds of trees is the latter end of ſummer, or beginning of autumn; they then ſeldom bleed much, and the wounds are commonly healed over before the weather ſets in to be bad and ſevere.

But very few ſorts of ornamental trees ſhould be much lopped, as it greatly injures their beauty and appearance. The only thing neceſſary is to take off ſuch ſtraggling branches as may grow out in an awkward or improper direction, and render them leſs ornamental. See Pruning *of trees*.

LOPPIS, in *Geography*, a town of Sweden, in the province of Nyland; 36 miles N.N.W. of Helſingfors.

LOPSCHENSKOI, a town of Ruſſia, in the government of Archangel, on the coaſt of the White ſea; 60 miles W. of Archangel.

LORA, a town of Spain, in the province of Seville; eight miles N. of Carmona.—Alſo, a town of Chili, on a river of the ſame name, which runs into the Pacific ocean, S. lat. 34° 46'; 105 miles S. of Valparaiſo.

LORAH, a town of Hindooſtan, in Bahar; 25 miles W.S.W. of Rotangur.

LORANCA, a town of Spain, in New Caſtile; eight miles S. of Hueta.

LORANGA, a river of Africa, which runs into the ſtraits of Mozambique, S. lat. 17° 30'.

LORANTHUS, in *Botany*, from λωρον, *a ſtrap* or *thong*, and ανθος, *a flower*, alluding to the long linear ſhape, and leathery ſubſtance, of the petals. Linn. Gen. 175. Schreb. 233. Willd. Sp. Pl. v. 2. 232. Mart. Mill. Dict. v. 3. Juſſ. 212. Lamarck Dict. v. 3. 594. Illuſtr. t. 258. Jacq. Amer. 97. (Lonicera; Gærtn. t. 27.)—Claſs and order, *Hexandria Monogynia*. Nat. Ord. *Aggregatæ*, Linn. *Caprifolia*, Juſſ.

Gen. Ch. *Cal.* Perianth ſuperior, a ſmall, concave, entire rim. *Cor.* Petals ſix, oblong, revolute, equal. *Stam.* Filaments ſix, awl-ſhaped, growing at the baſe of the petals, the length of the corolla; anthers oblong. *Piſt.* Germen inferior, oblong, crowned with the permanent calyx; ſtyle ſimple, as long as the ſtamens; ſtigma obtuſe. *Peric.* Berry oblong, of one cell. *Seed* oblong.

Eſſ. Ch. Germen inferior. Corolla ſix-cleft, revolute. Stamens at the tips of the petals. Berry ſingle-ſeeded.

Obſ. L. *europæus* differs from the other ſpecies in having dioecious flowers, and *L. pentandrus* in having its flowers five-cleft half way down, with five ſtamens.

Loranthus conſiſts of paraſitical ſhrubs, which are chiefly tropical, and many of them extremely beautiful. Linnæus enumerates eleven, in his fourteenth edition of the *Syſt. Veg.* and Willdenow has twenty-ſix, ſome of which are adopted from Swartz. Lamarck alſo, as he himſelf juſtly aſſerts, has made us acquainted with ſeveral new ſpecies not before known, and many have been found ſince in New Holland, which will doubtleſs be deſcribed by Mr. Brown.—The leaves in the whole genus are oppoſite, coriaceous or fleſhy, and entire, rarely veiny. Infloreſcence lateral, compound, moſtly racemoſe or ſomewhat corymboſe. Petals long, cohering in an early ſtate, ſo as to form an apparent tube, their colour generally red, orange or yellow. The following may ſerve to illuſtrate the genus.

L. *europæus*. Linn. Sp. Pl. 1672. Jacq. Auſtr. t. 30. —Cluſters ſimple, terminal. Flowers dioecious.—Found as a paraſite upon oaks, in Auſtria, Hungary, and Moravia, alſo, according to Pallas, in Siberia. It bears flowers in April and May, and perfects its fruit in October. *Stems* very much branched and forked, often four feet long, ſmooth. *Bark* brown, thick, tubercled, ſlightly aſtringent, and turning water red in which it has been macerated. *Wood* whitiſh and brittle. *Leaves* oblong, obtuſe, entire or emarginate, deciduous when the fruit is ripe. *Flowers* delicately fragrant, yellowiſh-green, in ſome plants altogether barren, in others all of them fertile. *Berry* of a yellow colour. This plant has much the habit and appearance of our Miſletoe, *Viſcum album*, and is very remarkable in its genus for being found in cold climates.

L. *loniceroides*. Linn. Sp. Pl. 473. (Itti Canni; Rheed. Mal v. 7. 55. t. 29.)—Flowers in an aggregated head, often pentandrous.—This is a native of groves in Aſia.—A very handſome ſpecies, whoſe *branches* are long and flexuoſe. *Leaves* ovate-lanceolate, thickiſh, entire, ſmooth, veined, bluntiſh. *Flowers* about five in a cluſter, ſeſſile, tubular, yellow, downy withinſide. Stamens generally five. *Fruit* round, greeniſh-yellow, containing a ſmall, white *nut*, which has a bitter flavour.

L. *corymboſus*. Lamarck Dict. v. 3. 599. (Lonicera corymboſa; Linn. Sp. Pl. 249. Periclymenum foliis acutis, floribus profundè diſſectis; Feuillée Peruv. v. 2. 760. t. 45.)—Corymbs axillary, oppoſite. Leaves ovate, acute. Flowers quadrangular, with four petals, and four ſtamens.—Native of Chili, from whence we have a ſpecimen, by favour of Mr. Menzies, which enables us better than Feuillée's figure to underſtand the ſpecies.—The *flowers* are of a blood red, with yellow ſtamens. By the laſt mentioned author's account this ſeems not to be paraſitical. It is uſed for dyeing a fine black colour.

LORANTHUS, in *Gardening*, compriſes a plant of the exotic kind for the ſtove, of which the ſpecies cultivated is, the American loranthus (L. Americanus.) Its branches are ſubdivided, leafy, ſmooth, pale green, brittle, and the leaves pale with red flowers.

This plant ramps over the higheſt trees in Jamaica, &c. eſpecially the coccoloba grandifolia, with the root adhering firmly to the bark like miſletoe.

Method of Culture.—This plant may be increaſed by ſowing the ſeeds, as ſoon as they are fully ripened, in pots of light rich earth, being kept in a mild hot-bed until the beginning of the autumn, when they muſt be plunged in the bark hot-bed of the ſtove, being afterwards treated as other tender plants of the ſame kind.

It affords variety in ſtove collections.

LORARII, among the *Romans*, officers whoſe buſineſs it was, with whips and ſcourges, to compel the gladiators to engage. The lorarii alſo puniſhed ſlaves who diſobeyed their maſters.

LORBUS, or LERBA, in *Geography*, a town of Africa, in the country of Tunis, anciently called "Laribus Colonia;" 10 miles W.S.W. of Tuberlak.

LORCA, anciently called *Cliocrata*, a town of Spain, of conſiderable ſize, in Murcia, ſituated very near the confines of the kingdom of Granada, at the foot of a ſteep mountain, conſiſting almoſt wholly of ſchiſt, and denominated the Sierra del Cano, on the right bank of the Guadalentin. It lies at the entrance of a fine rich country, abounding with trees, particularly olive and mulberry, fertilized by the above-mentioned river. The town had formerly a caſtle advantageouſly ſituated on the top of the mountain, which was ſtrong under the Moors and under the kings of Caſtile; but it is now in ruins. Lorca is now much larger than it was under the Moors, by whom it was taken in 714; it is divided into the upper and lower town, the former being the old part on the declivity of the hill formerly occupied by the Moors, and the latter, which is more modern and better built, ſtands altogether on level ground; it has four gates and ſeveral ſquares, and two ſuburbs, and its extent is ſufficient to accommodate 12,000 perſons. The population of Lorca is computed at about 30,000 inhabitants, partly noble of ancient families, and devoted to agriculture, and partly very poor: intermixed with the other inhabitants are ſeveral wandering vagabonds, called Gitanos or gypſies. Lorca has at preſent a collegiate chapter, eight pariſh churches, ſeven monaſteries, two nunneries, two hoſpitals, one for men and the other for women, and a college for the inſtruction of youth. It is governed by a corregidor, and twenty-four regidors, who form the principality; it has a manufacture of ſalt-petre, but has no kind of commerce. Some of the produce of the country is taken from it, particularly ſilk and kali; but this trade is carried on by foreigners, eſpecially the French, who are ſettled here. The town ſuffered much in 1802 by an inundation from a large baſon or reſervoir, which had been conſtructed of an immenſe ſize in order to water the whole of its adjacent territory. This baſon being undermined, the water ruſhed from it with ſuch impetuoſity, that it wholly deſtroyed one of its ſuburbs, conſiſting of about 600 houſes, and ſeveral public buildings, and extended its deſtructive ravages to an extent of 16 leagues, ſo that the number of people who periſhed was eſtimated at 6000 and the animals at 24,000. The whole loſs was eſtimated at 200 millions of reals, or about 2,083,333*l.* ſterling. Lorca is diſtant 42 miles W. from Carthagena. N. lat. 37° 38′. W. long. 2°.

LORCH, a town of Germany, the inhabitants of which chiefly ſubſiſt by cultivating vineyards and making wine; 24 miles W.N.W. of Mentz.

LORCHAUSEN, a town of Germany, ſeated on the Rhine; 27 miles W. of Mentz.

LORD, a title of honour attributed to thoſe who are noble, either by birth, or creation; and veſted with the dignity of a baron.

The word is of Saxon origin, and primarily denotes a bread-giver, alluding to the hoſpitality of our ancient nobles: it is formed, according to Camden, from *hlaford*, afterwards written *loford*; a compound of *hlaf*, *bread*, and *ford*, *to ſupply*, *afford*.

In this ſenſe, lord amounts to the ſame with peer of the realm, lord of parliament.

LORD is alſo applied to thoſe ſo called by the courteſy of England; as all ſons of a duke or marquis, and the eldeſt ſon of an earl.

LORD is alſo an appellation given to divers perſons honourable by office; as lord chief juſtice, lord chancellor, lord of the treaſury, admiralty, &c.

LORD is alſo a title ſometimes given to an inferior perſon who has a fee, and conſequently the homage of tenants within his manor.

For by his tenants he is called *lord*, and in ſome places, for diſtinction ſake, *land-lord*.

It is in this laſt ſignification that the word lord is principally uſed in our law-books, where it is divided into *lord paramount*, and *lord meſne*.

LORD *Meſne*, is he that is owner of a manor, and by virtue thereof hath tenants holding of him in fee, and by copy of court-roll; and yet holds himſelf of a ſuperior lord called *lord paramount*.

We alſo read of *very lord*, and *very tenant*.

LORD *in Groſs*, he who is lord, not by reaſon of any manor, as the king in reſpect of his crown, &c.

Very Lord, is he who is immediate lord to his tenant; and *very tenant*, he who holds immediately of that lord.

So that where there is lord paramount, lord meſne, and tenant; the lord paramount is not very lord to the tenant.

Lord *High-Admiral* of England, is one of the great officers of the crown, whoſe truſt and honour are ſo great, that it was formerly ſeldom given, except to ſome of the king's youngeſt ſons or near kinſmen.

To him is, by the king, entruſted the management of all maritime affairs, as well in reſpect to juriſdiction as protection; with the government of the Britiſh navy; and a power to decide all controverſies and cauſes maritime, as well civil as criminal; ſuch as happen either on our coaſts, or beyond ſea, among his majeſty's ſubjects.

To him alſo belong ſuch wrecks and prizes, as are called *lagon*, *jetſon*, and *flotſon*; that is, goods lying in the ſea, floating, or caſt aſhore, excepting in ſuch royalties as are granted to other lords of manors, &c. with all great fiſhes, called *royal fiſh*, except whales and ſturgeon; a ſhare of prizes in the time of war, and the goods of pirates and felons condemned.

The lord high-admiral has under him many officers of high and low condition; ſome at ſea, others at land; ſome of a military, others of a civil capacity; ſome judicial, others miniſterial.

This great office is now uſually executed by ſeven commiſſioners, who are ſtyled *lords of the admiralty*: one is called the firſt lord, with a ſalary of 3000*l.* a-year, the others have 1000*l.* a-year each. Under theſe there are a ſecretary and deputy-ſecretary, and ſeveral inferior clerks. See *Lord High* Admiral *of England.*

In the court, called the *court of admiralty*, all proceſſes iſſue in his name, not the king's, as they do in all other courts; ſo that the dominion and juriſdiction of the ſea may juſtly be ſtyled another commonwealth or kingdom apart, and the lord high admiral the viceroy of the maritime kingdom.

He hath under him a lieutenant, or deputy, who is judge of the admiralty, commonly a doctor of the civil law. See Court *of Admiralty.*

Lord *Privy-ſeal* has his office by patent: before the 30th of Henry VIII. he was generally an eccleſiaſtic; ſince which, the office has been uſually conferred on temporal peers, above the degree of barons.

The lord privy-ſeal, receiving a warrant from the ſignet-office, iſſues the privy-ſeal, which is an authority to the lord chancellor to paſs the great ſeal, where the nature of the grant requires the *Seal*; which ſee. But the privy-ſeals for money begin in the treaſury, from whence the firſt warrant iſſues, counterſigned by the lord treaſurer. On the lord privy-ſeal are attendant four clerks, who have two deputies to act for them.

Lord *Steward of the King's Houſhold*, is the principal officer for the civil government of the king's ſervants below-ſtairs; over the officers of which he has juriſdiction. See Houshold.

He is conſtituted by the delivery of the white ſtaff, which is eſteemed his commiſſion. By virtue of his office, without any other commiſſion, he judges of all offences committed within the court, or the verge thereof; and gives judgment according to their ſeveral deſerts. See Court.

At the death of the ſovereign he breaks his ſtaff over the grave in which the royal corpſe is depoſited, and thereby diſcharges all the officers under his power.

Lord *Advocate.* See Advocate.

Lord *High-Treaſurer.* See Treasurer and Houshold.

Lold *Chamberlain of the Houſhold.*
Lord *Great Chamberlain of England.* } See Chamberlain and Houshold.

Lord *High-Chancellor of England.* See Chancellor, and Court *of Chancery.*

Lords *of the Bed-Chamber*, are fourteen in number, under the lord chamberlain. See Bed-chamber, and Houshold.

Lords, *Houſe of.* See Peers.

Lords *of Seſſion.* See Session.

Lords *of the Treaſury.* See Treasury.

Lords *Lieutenants of Counties*, are officers of great diſtinction, appointed by the king for the managing of the ſtanding militia of the county, and all military matters therein. They are ſuppoſed to have been introduced about the reign of king Henry VIII., for they are mentioned as known officers in the ſtatute 4 and 5 Ph. & M. c. 3. though they had not been then long in uſe; for Camden ſpeaks of them, in the time of queen Elizabeth, as extraordinary magiſtrates conſtituted only in times of difficulty and danger.

They are generally of the principal nobility, and of the beſt intereſt in the county: they are to form the militia in caſe of a rebellion, &c. and march at the head of them, as the king ſhall direct.

They have the power of commiſſioning colonels, majors, captains, and ſubaltern officers; alſo to preſent the king with the names of deputy-lieutenants, who are to be ſelected from the beſt gentry in the county, and act in the abſence of the lords-lieutenants.

Subſervient to the lord-lieutenants and deputy-lieutenants, are the juſtices of peace; who, according to the order they receive from them, are to iſſue out warrants to the high and petty-conſtables, &c. for military ſervice, &c.

Lord's *Day.* See Sunday.

Lord *Howe's Group*, in *Geography*, a cluſter of iſlands in the Pacific ocean, diſcovered by captain Hunter in the year 1791. Thirty-two of theſe iſlands were diſtinctly counted from the maſt-head, and they lay at ſuch a diſtance, as to afford reaſon for ſuppoſing that they were more numerous. Some of the natives, who appeared in a boat, were clean, ſtout, well-formed perſons, of a dark copper-colour; their hair was tied in a knot at the back of their head, and they ſeemed to have ſome method of taking off their beards, of which they were deſtitute; but they had an ornament, conſiſting of a number of fringes, like an artificial beard, which was faſtened on between the noſe and mouth, to which hung a row of teeth, ſo that they appeared as if they had a ſecond mouth lower than their natural one; they had alſo pieces of reed, or bone, thruſt into holes in the ſides of the noſe, and paſſing through the ſeptum; their arms and thighs were tattowed, and ſome were painted with red and white ſtreaks; and their middle was covered with a wrapper. Their canoe, which was badly conſtructed, had an out-rigger, and was about forty feet in length. Theſe iſlands appeared to be very thickly covered with wood, among which the cocoa-nut was very diſtinguiſhable. S. lat. 5° 30′. E. long. 159° 24′.

LORDOSIS, from λορδος, *bent inwards*, in *Surgery*, an incurvation of the back bone; or, a curvature of the ſpine forwards.

LORE, in *Geography*, a town of the principality of Georgia, in the province of Karduel; 65 miles N.E. of Erivan.

LOREDO, or Loreo, a ſee of Italy, in the Venetian Dogada, near a canal of the Adige, anciently called "Lauretum Venetum." It is the principal place of a diſtrict, and contains about 2300 inhabitants; 20 miles S. of Venice.

LOREMBERG, a town of the county of Goritz; 7 miles E. of Goritz.

LORENTE, Andres, in *Biography*, a Spaniſh writer in muſic, and author of a book, now become very ſcarce, intitled "El porque del la Muſica," in which are contained the four arts of plain-ſong, figurative muſic, or proportion of time or meaſure, plain counterpoint, and compoſitions. Printed at Alcala in 4to. 1672.

This is truly a very ancient treatiſe, which defines and explains the whole art of muſic, as far as it was known at the time it was written. See Worgam, *Dr.*

LORENTZ, in *Geography*, a town of Pruſſia, in Samland, near the Baltic; 24 miles N.W. of Königſberg.

LORENTZEN, St., a town of the duchy of Stiria; 8 miles N.E. of Windiſch Gratz.

LORENZAGO, a town of Italy, in the Cadorin; 7 miles N.E. of Cadora.

LORENZINI, Francis Maria, in *Biography*, an eminent Italian poet, was born at Rome in 1680. He was educated among the Jeſuits, and in his twenty-ſecond year was received into their ſociety, but quitted it again within a few months, on account of ill-health. He was much attached to literature; but he was obliged, by the ſcantineſs of his means, to apply to ſome profeſſion for his neceſſary maintenance. He engaged in that of the law, which he practiſed with ſucceſs for a ſhort period, after which he devoted himſelf entirely to letters. He entered into the academy of the Arcadi, the chief object of which was the reformation of the bad taſte which had infected Italian poetry. The founders of this ſociety propoſed the ſtyle of Petrarch as a model, in oppoſition to the affected and conſtrained diction of Marino and others. Lorenzini did not quite approve the method of Petrarch, but borrowed ſome of the force of freedom of Dante, and thus excelled his contemporaries. He is ſaid alſo to have excelled in melodramas, or pieces on religious ſubjects, adapted to being ſung, written in the Latin language. In the conteſt between Creſcembini and Gravina, which divided the members into two parties, Lorenzini adhered to that of Gravina, which was the minority; he would not, however, agree to the propoſal to found a new academy, and after a ſucceſſion of three years, he was admitted among the old Arcadi. He was now, from an inattention to his domeſtic concerns, fallen into a ſtate of indigence, and, as evils rarely come ſingly, he had ſuffered much from ſome calumnious reports. Being obliged, on this latter account, to appear before the prefect of the city, he ſo completely juſtified himſelf, that this magiſtrate, Falconeri, to ſhew the eſtimation in which the poet was held by himſelf, gave him a place in his houſhold. He now felt himſelf elevated above the misfortunes of life, and with a fine flow of ſpirits ſpent a part of every day in writing verſes. In theſe he diſplayed an enthuſiaſm of conception, and a loftineſs of language, which diſtinguiſhed him among his contemporaries. He has been denominated the Michael Angelo of Italian poets, on account of the boldneſs and energy of his expreſſions. To excite wonder and admiration, he conſidered as the peculiar office of poetry, whence he became an enthuſiaſtic admirer, and almoſt perpetual reader of the Hebrew poets, which never failed to inſpire him with rapture. He had a great paſſion for the ſcience of anatomy, and had made, in conjunction with an eminent ſurgeon at Rome, ſome new obſervations, which they meant to have publiſhed as the reſult of their united labours, but which were ſurreptitiouſly ſtolen from them. In 1728, Lorenzini was choſen preſident of the academy, and ſhewed his fitneſs for the office by ſeveral remarkable acts. He founded five academical colonies in the neighbouring towns, and inſtituted a private weekly meeting of the Arcadi, at which the plays of Plautus or Terence, in the original language, were performed by youths trained for the purpoſe. Theſe exhibitions were frequented by ſeveral perſons of rank, and were favoured by pope Clement XII., who often ſent conſiderable ſums to Lorenzini to defray his expences. Being deprived by death of his friend Falconeri, his circumſtances were again deranged, and he was relieved, in this inſtance, by cardinal Borgheſe, who enrolled him among his noble domeſtics, and paid him liberally without requiring any ſervice. In 1741, he diſcontinued his theatrical exhibitions, retired to apartments in the Borgheſe palace, where he applied to letters with more aſſiduity than ever. He wrote much Latin and Italian poetry; but his chief ſtudies were directed to the ſacred writings. In the midſt of his employments, he died in June 1743. He was faithful and liberal, and his houſe was open to young men who were deſirous of improvement. His Italian poems are few, but of great excellence. He publiſhed the lives of two of the Falconeri family. Gen. Biog.

LORENZO, in *Geography*, a ſmall iſland in the Pacific ocean, near the coaſt of Peru. S lat. 12° 4.

Lorenzo, *St.*, a town of Iſtria, and capital of a diſtrict; 9 miles N.N.E. of Rovigno. N. lat. 45° 16′. E. long. 13° 52′.

Lorenzo *de Borucas*, a town of Mexico, in the province of Coſta Rica; 65 miles S. of Carthago. N. lat. 9° 15′. W. long. 84° 6′.

Lorenzo, *St.*, a town of South America, in Braſil, and government of Fernambuco.—Alſo, a town of Naples, in Baſilicata; 9 miles N.E. of Venoſa.—Alſo, a town of Naples, in Capitanata; 3 miles S.E. of Leſina.—Alſo, a town of Naples, in Calabria Ultra; 8 miles W. of Bova.—Alſo, a town of Campagna di Roma, near the ſea-coaſt; 8 miles E.S.E. of Oſtia.—Alſo, a town of Paraguay; 270 miles S.E. of Aſſumption.—Alſo, a river of Sicily, which runs into the ſea, on the W. coaſt, N. lat. 38°. E. long. 12° 40′.—Alſo, a town of Mexico, in the province of New Biſcay; 85 miles N.W. of Parral.—Alſo, a town of Italy, in the Poleſine di Rovigo; 2 miles S.W. of Rovigo.

Lorenzo *de Pecuries*, *St.*, a town of New Mexico, on the Bravo; 45 miles N. of Santa Fé.

Lorenzo *el Real*, *St.*, a town of Spain, in Old Caſtile; 26 miles S. of Segovia.

Lorenzo, *Cape St.*, a cape on the coaſt of Peru, in the province of Quito, W. of the city of that name. S. lat. 0° 20′. W. long. 80° 20′.

LORETI, Il Cavalier Vittorii, in *Biography*, according to Adami, was a ſoprano ſinger in the papal chapel, 1622; one of the firſt evirati employed in muſical dramas on the ſtage, at the beginning of operas; and a celebrated compoſer of Arie *a Cantate da Camera;* which ſee.

LORETTO, in *Geography*, a ſmall, indifferently built, walled town and biſhop's ſee, in the marquiſate of Ancona, in Italy, conſiſting chiefly of one ſtreet within the walls, and another without as a ſuburb, containing 7000 inhabitants, pleaſantly ſituated on an eminence, 3 miles from the ſea-ſhore, 17 S. of Ancona, and 160½ N.E. of Rome. It is principally famous for the holy houſe, or Casa *Santa;* which ſee.

Loretto, a ſmall village of Chriſtian Indians, 3 leagues N.E. of Quebec, in Lower Canada; deriving its name from a chapel, a chapel, built according to the model of the Santa Caſa at Loretto in Italy; from whence an image of the holy Virgin has been ſent to the converts here, ſimilar to that in the famous Italian ſanctuary. Theſe converts are of the Huron tribe.

Loretto, *Lady of*, a place in the diſtrict of St. Dennis, on the iſthmus of California, called by the Indians "Caneho;" in which is a ſmall fort, erected by the miſſionaries, conſiſting of four baſtions, and ſurrounded by a deep ditch. In this juriſdiction are fifteen pariſhes, including 4000 profeſſing Indians, under the inſtruction of Dominican friars.

Loretto, or *Loreto*, a town of the iſland of Corſica; 7 miles N E of Porta.—Alſo, a town of New Mexico, in the province of Mayo; 105 miles E N.E. of Santa Cruz.—Alſo, a town of South America, in the province of Buenos Ayres; 200 miles E. of Corrientes.—Alſo, a town of South America, in the government of Majos, on the Marmora; 50 miles S. of Trinidad.

Loretto, *Order of*, in *Heraldry*, an order of knighthood, inſtituted by pope Sixtus V. in 1587, confirmed by pope Paul III., and aboliſhed by pope Gregory XIII. The knights wore, pendent to a ribbon at their button-hole, a ſmall gold medallion, enamelled with the image of the virgin of Loretto.

LORGUES, in *Geography*, a town of France, in the department of the Var, and chief place of a canton, in the diſtrict of Draguignan; 6 miles S.W. of Draguignan. The place contains 4923, and the canton 10 820 inhabitants, on a territory of 302 kiliometres, in 6 communes.

LORI, in *Ornithology*. See Psittacus *Amboinenſis*.

LORICARIA, in *Natural Hiſtory*, a genus of fiſhes of the order abdominales. The generic character is, head ſmooth, depreſſed; mouth without teeth, retractile; gill-membrane ſix-rayed; body mailed, hence its name. According to Gmelin, there are but two ſpecies; but Dr. Shaw deſcribes ſeven, which we ſhall enumerate in their order.

Species.

Costata; Ribbed loricaria. Yellowiſh-brown, mailed by a ſingle row of ſhields on each ſide, with a *forked* tail. This fiſh, in its general habit, reſembles a ſpecies of the ſilurus, the mouth being furniſhed with long cirri, and the firſt rays of the dorſal and pectoral fins ſerrated; the head is large, depreſſed, covered with a rough bony ſhield, projecting on each ſide the thorax into an exceedingly ſtrong and obtuſely pointed ſpine of conſiderable length; the whole body, from the thorax, is ſtrongly mailed along each ſide by a continued ſeries of very broad bony plates or ſcales, each of which projects in the middle into a ſhort hooked ſpine or curved proceſs; the upper and under parts of the body, from the ſmall dorſal fin to the tail, are mailed in the ſame manner, but with ſmaller plates than on the ſides; the tail is large and ſharply forked. It is a native of the Indian and American ſeas; is a fiſh of great boldneſs, and is dreaded by fiſhermen; the ſtrength and ſharpneſs of its ſpines enabling it to inflict very painful, and even dangerous wounds.

Cataphracta; Armed loricaria. Brown, mailed by a ſingle row of ſhields on each ſide, with a *rounded* tail. This ſpecies is nearly allied to the preceding, but differs in having a rounded tail, and in ſome other particulars. It is about ten inches long, and is found in the American ſeas.

Callichthys; Soldier loricaria. Brown, with depreſſed, rounded head, double row of ſcales on each ſide, and rounded tail. This remarkable ſpecies grows to the length of ten or twelve inches, and is of a duſky brown colour throughout, with a tinge of reddiſh or yellowiſh-brown on the fins and under parts. It is highly eſteemed as an article of food by the inhabitants of Surinam. It has been aſſerted, and Dr. Shaw has given currency to the report, probably without attaching any credit to it, that this fiſh, when diſtreſſed for want of water, by the ſtreams which it inhabits being too ſhallow for it, contrives to make its way over land, in order to diſcover ſome deeper ſtream; and occaſionally perforates the ground for the ſame purpoſe

Punctata; Speckled loricaria. Yellow, with browniſh back; double row of ſcales on each ſide; fins ſpeckled with black, and forked tail. A ſmall, but elegant ſpecies. Length five or ſix inches; ſhape like the generality of fiſhes. Native of the rivers of Surinam.

Accipenser; Sturgeon loricaria. Yellowiſh-brown, with toothleſs mouth, rounded front, and ſpotted fins. This, as its name imports, is ſomething like a ſturgeon, and long and ſlender. It is a native of the Indian ſeas, and grows to the length of twelve or fifteen inches. This ſpecies is deſcribed by Bloch as L. dentibus carens.

Dentata; Toothed loricaria. Yellowiſh-brown, with toothed, cirrated mouth, and ſlightly pointed ſnout. This differs from the laſt, in having the mouth furniſhed with teeth, and in having a ſlightly pointed ſnout. It is a native of the Indian ſeas.

Flava; Yellow loricaria. Yellow, ſpotted with brown, with two dorſal fins and tail marked by tranſverſe bands. This is an elegant ſpecies, in length about ten inches; habit much more ſlender than in the two preceding. Inhabits the Indian ſeas.

LORICATION, or Coating, in *Chemiſtry*, is the covering of a glaſs or earthen veſſel with a coat or cruſt of a matter able to reſiſt the fire, to prevent its breaking in the performing of an operation that requires great violence of fire.

When veſſels are expoſed to a fire too ſtrong for their ſtructure, or to the corroſive quality contained in them, or on the throwing on of freſh cold fuel into the fire where they ſtand, it frequently happens that they crack and burſt; for the preventing of which, the operator has recourſe to this method of coating or loricating his veſſels. It is performed in the following manner: take a quantity of waſhed clay, with an admixture of pure ſand, powder of calcined flints, or broken crucibles; and inſtead of pure water, moiſten it with freſh blood that has not yet been coagulated, diluted with twice or three times its quantity of water; make the clay with this into a thin paſte, and work into it ſome cow's hair, or other hair not too long nor too ſtiff, and a little powdered and ſifted glaſs, if you have it at hand; ſmear over the veſſel intended to be uſed with this paſte, by means of a pencil, and ſet it to dry; when dry, beſmear it again, and repeat the operation till the veſſel have a cruſt of a third, or a quarter of an inch, at leaſt, thick of this matter, and let it be thoroughly dry before it is uſed.

To keep blood in a proper ſtate for this uſe, it muſt, when juſt let out from the animal, be well ſtirred about with a ſtick for ſome time, at leaſt till it is quite cold; and being thus prepared, it will keep for ſome days without coagulating, and fit for uſe.

This compoſition, with an admixture of bole, worked into a paſte with the whites of eggs, diluted with water, makes alſo the proper lute for cloſing the junctures of other chemical veſſels, in the diſtilling ſtrong ſpirits. See Lute.

LORIMERS, one of the companies of London, that make bits for bridles, ſpurs, and ſuch like ſmall iron ware.

They are mentioned ſtat. 1 Rich. II. cap. 12. See COMPANY.

The word ſeems derived from the Latin, *lorum*, a thong.

LORIOL, in *Geography*, a town of France, in the department of the Drôme, and chief place of a canton, in the diſtrict of Valence; 12 miles S. of Valence. The place contains 2392, and the canton 6654 inhabitants, on a territory of 177½ kiliometres, in 5 communes.

LORIOT, in *Ornithology*. See ORIOLUS *Galbula*.

LORIPES, the name uſed by ſome authors for the himantopus, a bird of the water-kind, remarkable for the length and weakneſs of its legs. See CHARADRIUS *Himantopus*.

LORIS, in *Zoology*, a ſpecies of lemur in the Linnæan ſyſtem, being the lemur tardigradus of Buffon, deſcribed by Buffon. See LEMUR *Tardigradus*.

LORME, PHILIBERT DE, in *Biography*, an eminent French architect, was born at Lyons in the early part of the ſixteenth century. He went to Italy, when he was but fourteen years of age, to ſtudy the art for which he ſeemed to have a ſort of natural taſte. His aſſiduity attracted the notice of cardinal Cervino, afterwards pope Marcellus II., who took him into his palace, and aſſiſted him in his purſuits. He returned to France in 1536, and was the means of baniſhing the Gothic taſte in buildings, and ſubſtituting in its place the Grecian. He was employed by Henry II., for whom he planned the horſe-ſhoe at Fontainbleau, and the chateaus of Anet and Meudon. After the demiſe of the king, he was made inſpector of the royal buildings by Catharine de Medicis; and under her direction he repaired and augmented ſeveral of the royal reſidences, and began the building of the Thuilleries. In 1555 he was created counſellor and almoner in ordinary to the king; and as a recompence for his ſervices, he was preſented with two abbacies. Theſe honours, it is ſaid, made him arrogant, which occaſioned the poet Ronſard to ſatirize him in a piece, entitled "La Truelle Croſſée," or "The croziered Trowel." De Lorme took his revenge, and ſhut the garden of the Thuilleries againſt him; but the queen took part with the poet, and ſeverely reprimanded the reverend architect. De Lorme died in 1577. He publiſhed "Dix Livres d'Architecture," and "Nouvelles Inventions pour bien batir et a petits Frais." Moreri.

LORME, in *Geography*, a town of France, and ſeat of a tribunal, in the department of the Niévre; 33 miles N.E. of Nevers.

LORN, a diſtrict of Scotland, in the north part of the county of Argyle; whence the eldeſt ſon of the duke of Argyle takes the title of marquis of Lorn.

LOROMIE'S STONE, a place of America, in the ſtate of Ohio, weſterly from fort Lawrence, and near a fort of a branch of the great Miami river, which falls into the Ohio. At this ſpot, bounded weſt by the Indian line, the Indians ceded a tract of land to the United States, ſix miles ſquare, by the treaty ſigned Auguſt 3, 1795. Here the portage commences between the Miami of the Ohio and St. Mary's river, which runs into lake Erie.

LOROUS, a town of Tunis, anciently called "Laribus;" 60 miles S.W. of Tunis.

LOROUX BECONNOIS, LE, a town of France, in the department of the Maine and Loire; 13 miles W.N.W. of Angers.

LOROUX *Bottereau*, a town of France, in the department of the Lower Loire, and chief place of a canton, in the diſtrict of Nantes; 10 miles N. of Cliſſon. The place contains 1178, and the canton 8536 inhabitants, on a territory of 157½ kiliometres, in 5 communes.

LORQUI, a town of Spain, in Murcia; 12 miles N.W. of Murcia.

LORRACH, or LARACH, a town of the duchy of Baden; 6 miles N.E. of Bâle.

LORRAIN, ROBERT LE, in *Biography*, an eminent ſculptor, was born at Paris in 1666. He was pupil of Gerardon, who confided to him, at the age of eighteen, the inſtruction of his own children, and the correction of the deſigns of his other pupils. Having diſtinguiſhed himſelf by ſeveral works, and carried away the firſt prize at the academy, he went to Rome for improvement. In 1693 he returned; but owing to the misfortunes of the times, he found ſcarcely any employment. In 1701 he was admitted into the academy of painting and ſculpture, on account of his great merit as an artiſt. He was perfectly unaſſuming in his manners, and took no heed of putting himſelf forward; ſo that his works, which always attracted notice, were much more known than his perſon. In 1710 he was nominated adjunct profeſſor in the academy; and in 1717 he filled the office of profeſſor. The duties of theſe offices he fulfilled with great attention; and he could boaſt of having inſtructed in his art ſeveral pupils of extraordinary merit. He executed much of the exterior ſculpture of the palace of Saverne, near Straſburg, for the cardinal de Rohan; but in the midſt of his labours, and of an increaſing reputation, he was attacked by a ſtroke of apoplexy in 1738, which obliged him to return to Paris, where he lingered ſeveral years, till death terminated his afflictions in 1743. Lorrain was diſtinguiſhed by his character-heads; of which, thoſe of young perſons, particularly of the female ſex, are often exquiſitely beautiful, with airs of ſingular grace and elegance. Gen. Biog.

LORRAIN, *Duchy of*, in *Geography*, united to France, and, together with the duchy of Bar, now divided into the departments of the Meuſe, the Meurthe, the Moſelle, and the Voſges; which ſee reſpectively. This country forms only a ſmall part of a kingdom, which bore that name, and which extended from Vienne on the Rhône to Cologne. Separated from Bar, it is about 90 miles in length, and 69 in breadth. The principal rivers are the Meuſe, the Moſelle, the Meurthe, and the Saar.

According to Chaucer, we know not on what foundation, Lorrain abounded in ſingers ſuperior to thoſe of France:

> "There mighteſt thou ſe theſe flutours,
> Minſtalles, and eke jugilours,
> That well to ſinging did their pain,
> Some ſongen ſonges of Loraine;
> For in Loraine their notis be
> Fut ſweeter than in this contrè."

LORRAINE, CHARLES DE, in *Biography*, cardinal and archbiſhop of Rheims, younger ſon of Claude de Lorraine, firſt duke of Guiſe, was born in 1525. He was created archbiſhop of Rheims, at the age of fifteen, by Francis I., and cardinal by pope Paul III. in 1547. At the death of his uncle, the cardinal John of Lorrain, in 1550, he ſucceeded to a rich courſe of benefices, which, it appears, amounted in the whole to two archbiſhoprics, ſix biſhoprics, and ſeveral rich abbacies. In addition to high birth, he poſſeſſed a fine perſon, quick parts, a natural flow of eloquence, and no inconſiderable ſhare of learning. Through the intereſt of Diana de Poitiers, miſtreſs of Henry II., he was ſent out as his ambaſſador to the pope. He ſoon entered into the views of the holy pontiff, and perſuaded the king his maſter to undertake a war for the conqueſt of Naples, in which his brother, the duke of Guiſe, had the principal command. He was a bitter enemy to the reformers of the age, and promoted ſeveral ſevere and cruel edicts againſt them. He made the utmoſt efforts in his power to introduce into his own country the infernal inquiſition; a point which he would probably have carried, but for the oppoſition of the excellent chancellor de l'Hopital, ſeconded by the good ſenſe and temper of the people. During the ſhort reign of Francis II. the cardinal uſurped and maintained a moſt deſpotic authority: but he was equally zealous for his own fame as he was for the honour of the Catholic religion. At the conference of Poiſſy between the two religious parties, he gained ſome reputation, at leaſt with thoſe who felt it their intereſt to flatter him, by his eloquence in refuting the learned Beza; but it was not very difficult to confound the antagoniſt, who had truth and not power on his ſide, and whoſe reaſoning was treated as blaſphemy. The cardinal was likewiſe ambitious of the praiſe of pulpit eloquence, and preached ſeveral times at Paris before large audiences; and the violence of his diſcourſes againſt the Proteſtants led the people to regard him as one of the principal authors of the furious civil wars under Charles IX., crowned by the horrid maſſacre of St. Bartholomew's. He was remarkably fond of ſhow, and appeared with ſplendour at the council of Trent; at which, it is reported, Pius V., who denominated him "the little pope beyond the mountains," did not wiſh for his preſence. The death of his brother, the duke, diminiſhed his conſequence; and he found it neceſſary to relax in the vigour with which he began in maintaining the intereſts of the Gallican church. During the reign of Charles IX. he was the miniſter of ſtate, and alſo ambaſſador to the court of Spain. On the acceſſion of Henry III. he went to meet that prince at Avignon, on his way from Poland; and, in a religious proceſſion, placed himſelf at the head of the "blue penitents." This was the laſt ſhow in which he figured, being at the time ſeized with a fever, which terminated his life in December 1754, in the fiftieth year of his age. It is difficult to draw the character of this cardinal. His enmity to the Proteſtants cauſed him to be the object of much party ſatire and reproach. They probably exaggerated his failings and immoralities: but making due allowance for the effect of private enmities, ſtill it muſt be admitted he was a man of exceedingly licentious habits, and who expected, perhaps, to bury his faults by his zeal for the church, or by an exceſs of oſtentatious alms-giving. "He was accuſtomed," ſays one of his biographers, "to carry a great leathern purſe, which his valet-de-chambre took care to fill every morning with three or four hundred crowns; and as many poor as he met, he put his hand into his purſe, and gave them a handful of money without counting. But if he were prodigal in his alms, he was not leſs ſo in gifts to other perſons, and eſpecially to the ladies, whoſe favours he readily procured by this bait; and it was aſſerted that there were very few, married or ſingle, frequenting the court at that time, who were not debauched by the largeſſes of the cardinal." By Maimbourg it is aſſerted, that the cardinal was the boldeſt of men in forming mighty ſchemes in his cloſet, but the weakeſt and moſt timid when they were put into execution. He was venerated by the clergy as the guardian of their immunities; by the Catholics in general, as the champion of their faith. Verſed in the wiles of courts, fruitful in expedients, and eloquent in debate, he was too readily elated by ſucceſs, and too eaſily depreſſed by defeat. His perſonal courage was ever a ſubject of doubt; his vindictive temper was at all times dreaded; and the diſſolute pleaſures of his private vied with the preſumption of his public conduct. Some of his literary compoſitions have been printed: they conſiſt chiefly of harangues on public occaſions. Hiſtory of France, London, 1790. Bayle. Moreri.

LORRES, in *Geography*, a town of France, in the department of the Seine and Marne, and chief place of a canton, in the diſtrict of Fontainebleau. The place contains 610, and the canton 9193 inhabitants, on a territory of 257½ kiliometres, in 18 communes.

LORRIS, William de, in *Biography*, a French poet, who flouriſhed about the middle of the thirteenth century, is known as the author of the "Roman de la Roſe," a poem much in requeſt in the middle ages. Under the allegory of a roſe-tree, planted in a delicious garden, and protected by bulwarks, it deſcribes a lover's purſuit, and final acquiſition of the object of his paſſion. He did not live to finiſh his work: it was completed in the next century by John de Meun. The part by Lorris, though the ſhorteſt, is by much the moſt poetical, abounding in rich and elegant deſcription, and in lively portraiture of allegorical perſonages. The beſt edition of this poem is that of the Abbé de Lenglet, three vols. 12mo. 1735. Chaucer tranſlated that part which belonged to Lorris. Gen. Biog.

Lorris, in *Geography*, a town of France, in the department of the Loiret, and chief place of a canton, in the diſtrict of Montargis; 12 miles S.W. of Montargis. The place contains 1526, and the canton 6528 inhabitants, on a territory of 205 kiliometres, in 13 communes.

LORRY, Anne-Charles, in *Biography*, a learned phyſician, was born at Croſny, near Paris, in 1725. He ſtudied and practiſed his profeſſion with unremitting zeal and peculiar modeſty, and obtained a high reputation. In 1748 he was admitted doctor of the faculty of medicine at Paris, and ſubſequently became doctor-regent of the faculty. He was author of ſeveral works, ſome of which ſtill maintain their value. His firſt publication was entitled "Eſſai ſur l'Uſage des Alimens, pour ſervir de Commentaire aux livres diététiques d'Hippocrate," Paris, 1753, 12mo.; the ſecond part of which appeared in 1757. His next publication was an edition of the Aphoriſms of Hippocrates, Greek and Latin, in 1759. Afterwards he produced a treatiſe "De Melancholia et Morbis Melancholicis," ibid. 1765, in two volumes 8vo. and edited Dr. Aſtruc's "Memoires pour ſervir á l'Hiſtoire de la Faculté de Médecine de Montpellier," ibid. 1767, 4to.; and "Sanctorii de Medicina Statica," with a commentary, 1770, in 12mo. His laſt work, which combined the merits of much erudition and accurate obſervation, with great clearneſs of arrangement and perſpicuity of language, was "Tractatus de Morbis Cutaneis," Paris, 1777, in 4to. Dr. Lorry alſo edited a Latin edition of the works of Mead, and a French one of Barker's diſſertation on the conformity of the doctrines of ancient and modern medicine. He died at the baths of Bourbonne, in 1783. Eloy Dict. Hiſt. de la Med. Gen. Biog.

LORSQUEN, in *Geography*, a town of France, in the department of the Meurthe, and chief place of a canton, in the diſtrict of Sarrebourg; four miles S.S.E. of Sarrebourg. The place contains 1164, and the canton 13,680 inhabitants, on a territory of 390 kiliometres, in 29 communes.

LORUNGAH, a paſs in the mountains of Bengal; 18 miles W. of Ramgur.

LORY, in *Ornithology*. See Psittacus *Garrulus*, &c.

LOS Reyes. See Lima.—Alſo, the chief town of the province of Uragua, in the eaſt diviſion of Paraguay, in South America.

Los *Charcos*, a province in the ſouthern diviſion of Peru, the chief cities of which are Potoſi and Porco.

LOSARI, a town of the iſland of Corſica; 15 miles N. of Calvi

LOSDORF, a town of Bohemia, in the circle of Leitmeritz; ſix miles W.S.W. of Kamnitz.

LOSENITZA, a town of European Turkey, in Servia; 30 miles S S.W. of Sabacz.

LOSER, a town of the electorate of Salzburg, on the Stampach; 21 miles S.W. of Salzburg.

LOSITZ, a town of Naples, in the province of Bari; ſix miles E. of Bittetto.

LOSORGA, St., a town of the iſland of Sardinia; 11 miles S. of Boſa.

LOSQUET, a ſmall iſland in the Engliſh channel, near the coaſt of France. N. lat. 43° 49′. W. long. 3° 31′.

LOSS, *Iſlands of*, a cluſter of ſmall iſlands in the Atlantic, near the coaſt of Africa. N. lat. 9° 16′. W. long. 13°.

LOSSA, a town of Sileſia, in the principality of Brieg; five miles S.E. of Brieg.

LOSSAU, a town of Germany, in the principality of Bayreuth; nine miles S.E. of Bayreuth.

LOSSIEMOUTH, a ſeaport town of Scotland, in the county of Murray, at the mouth of the river Loſſie, famous for its trout. A few fiſhing veſſels belong to the place; but its harbour is convenient for veſſels of 50 tons; ſix, miles N. of Elgin.

LOSSIN, or Lassin, *Great*, a town in the S. part of the iſland of Cherſo, containing about 1800 inhabitants.

Lossin, *Little*, a town of the ſame iſland, containing about 1600 inhabitants; one mile S. of Great Loſſin.

LOSSIUS, Lucas, in *Biography*, of Lunenburg, a Lutheran divine and ſchool-maſter, well ſkilled in muſic, who publiſhed at Nuremburg, in 1553, "Erotomata Muſicæ practicæ," and Lutheran pſalmodia. At the time of the Reformation the Lutherans preſerved more muſic in their liturgy than the Calviniſts, or the church of England.

LOSSNITZ, in *Geography*, a town of Saxony, in the lordſhip of Schonburg; 50 miles E. of Dreſden. N. lat. 50° 32′. E. long. 12° 37′.

LOSTORFF, a town of Auſtria; nine miles W. of St. Polten.

LOSTWITHIEL, a borough, market-town, and pariſh in the hundred of Powder, and county of Cornwall, England, is ſituated in a narrow valley on the weſtern ſide of the river Fawy, 25 miles diſtant from Launceſton, and 234 from London. The houſes are principally diſpoſed in two ſtreets, running parallel from the river to the bottom of a ſteep hill, which riſes to a great height on the weſt. The buildings are chiefly of ſtone, and covered with ſlate, which is obtained in great abundance in the vicinity of the town. The church conſiſts of one large and two ſmall aiſles, with a tower at the weſt end, terminating in a ſingular open ſpire. The font is conſtructed of a large octangular block of free-ſtone, ſupported by five cluſtered columns, charged with rude and ill-executed ſculptures. In the ſouth aiſle is an ancient monument of the time of Elizabeth, with eight ſmall figures, in baſſo-relievo, kneeling, erected in memory of Temperance, wife of William Kendall, eſq. who died in 1579. At a ſmall diſtance to the ſouth of the church are the external walls of an old building called the palace, which was anciently a reſidence of the dukes of Cornwall, but is now converted into the ſtannary priſon. This fabric was once very extenſive; but great part of its ſcite is occupied by timber yards. The walls are extremely thick, and, like many ancient caſtles, ſeem to have been conſtructed with ſmall ſtones, fixed by a liquid cement, now become harder than the ſtone itſelf. Loſtwithiel was incorporated at a very early period; numerous privileges were conferred on it by Richard, king of the Romans, who, by charter, made it a free burgh, and granted to its burgeſſes the liberty of a guild mercatory. They alſo poſſeſs the anchorage dues of Fawy harbour, and various duties on coal, ſalt, corn, malt, and other commodities brought into that port. The corporation conſiſts of a mayor, ſix burgeſſes, and ſeventeen aſſiſtants, or common councilmen, who are choſen annually by the mayor and burgeſſes. The borough has returned two members to parliament ever ſince the 23d of Edward I.; the right of election is confined to the corporation. This was anciently the ſhire town; and the county members are ſtill elected here, and the county weights and meaſures kept here. According to the enumeration made in the year 1801, this town contained 125 houſes, and 743 inhabitants. A market is held on Friday, and three fairs annually.

About one mile north of Loſtwithiel, on the ſummit of a very high hill, are the mouldering remains of Reſtormel caſtle, a fortreſs magnificent in ruin, and proudly exalting its ivy-clad walls above the contiguous narrow winding vallies. This was one of the principal reſidences of the earls of Cornwall: Richard, king of the Romans, kept his court here; his ſon Edmund alſo made this caſtle his abode; and though now in decay, yet the grandeur of its ruins, and the importance they communicate to the ſurrounding ſcenery, render it peculiarly intereſting. The caſtle and its honour were part of the inheritance of the dukes and earls of Cornwall; and were annexed by Edward III. to the duchy; but the manſion formerly connected with the eſtate, and named the Trinity-houſe, is now the property of the earl of Mount Edgecumbe, and called Reſtormel. Beauties of England and Wales. vol. ii.

LOSZLAU, or Wodislau, a town of Sileſia, and chief place of a lordſhip, in the principality of Ratibor; 11 miles S.E. of Ratibor. N. lat. 49° 57′. E. long. 18° 18′.

LOT, ſo called from the river, which riſes in the department of the Lozere, and joins the Garonne, near Aiguillon, formerly *Quercy*, one of the nine departments of the ſouthern region of France, lying in 44 30′ N. lat, N.N.W. of Tarn, and equidiſtant from both ſeas; bounded on the N. by the department of the Correze, on the E. by the Cantal, on the S.E. by the Aveiron, on the S. by the Tarn and the Upper Garonne, on the W. by the Lot and Garonne, and on the N.W. by the Dordogne; 34 French leagues in length and 30 in breadth, containing 7432½ kiliometres, or 362 ſquare leagues, and 383,683 inhabitants. It is divided into four circles or diſtricts, 41 cantons, and 440 communes. The circles are Montauban, including 115,954, Figeac, 80,372, Gourdon, 75,861, and Cahors, 111,496 inhabitants. The capital of the department is Cahors. Its contributions amount to 3,235,544 fr. and its expences to 272,533 fr. 33 cents. This department is, in general, hilly, but contains ſome fruitful plains and vallies. Its products are grain, wine of an excellent quality, fruits, ſilk, hemp, flax, tobacco, and paſtures. It has iron mines, coal, and mineral ſprings.

Lot *and Garonne*, formerly *Agenois*, one of the nine departments of the ſouth-weſt, or Garonne region of France, lying in 44° 30′ N. lat. and bounded on the N. by the department of the Dordogne, on the E. by the Lot, on the S. by the Gers, and on the W. by the Landes and Gironde, 23 French leagues in length and 18 in breadth, containing

6100 kiliometres, or 36,308 ſquare leagues, and 352,908 inhabitants. It is divided into four circles, 38 cantons, and 459 communes. The circles are Agen, including 107,840, Marmande, 112.091, Nerac, 43,119, and Villeneuve d'Agen, 89 858 inhabitants. Its contributions amount to 3,807,413 fr. and its expences to 292,739 fr. 33 cents. Its capital is Agen. The ſurface of this department is diverſified by fruitful eminences; but two-thirds of the ſoil are of a very inferior quality. It has ſeveral marſhy tracts; the Landes conſiſts of moveable ſands; ſome parts near the Lot have a rugged and barren aſpect; but the circle of Villeneuve d'Agen is diſtinguiſhed by its fertility. The products are grain, fruits, few trees, and indifferent paſtures. It has iron mines.

Lot's *Wife*, a ſtupendous rock in the ſea, encompaſſing the Ladrones, which riſes in the form of a pyramid, and is thus deſcribed by Mr. Meares in his voyage, cited by Mr. Pinkerton. "The latitude was 29° 50′ N., the longitude 142° 23′ E. of Greenwich. The waves broke againſt its rugged front, with a fury proportioned to the immenſe diſtance they had to roll before they were interrupted by it. It roſe almoſt perpendicular to the height of near 350 feet. A ſmall black rock appeared juſt above the water, at about 40 or 50 yards from the weſtern edge. There was a cavern on its ſouth-eaſtern ſide, into which the waters rolled with an awful and tremendous noiſe. In regarding this ſtupendous rock, which ſtood alone in an immenſe ocean, we could not but conſider it as an object which had been able to reſiſt one of thoſe great convulſions of nature that change the very form of thoſe parts of the globe which they are permitted to deſolate."

Lot, in a legal ſenſe. See Scot.

Lot, or *Loth*, in *Mining*, is the thirteenth diſh, meaſure, or part of the miner's ore, which the bar-maſter takes up for the king, or the farmer.

Lot, or *Pot*, a liquid meaſure in French Flanders, each equal at Liſle to 126 cubic inches, and 183.33 = 100 Engliſh gallons.

LOTA, in *Ichthyology*, the name of a ſpecies of the Muſtela fluviatilis. See Gadus *Lota*.

LÓ-TCHEOU, in *Geography*, a town of Corea; 22 miles W.S.W. of Koang-tcheou.

LOTE Tree, in *Botany*. See Celtis.

LOTH, in *Geography*, a town of Scotland, in the county of Sutherland, on the E. coaſt; 16 miles N.N.E. of Dornoch.

Loth, or *Lod*, a weight in Germany; 2 loths being = 1 oz. and 16 oz. = 2 marks = 1 pfund or pound. In eſtimating the fineneſs of ſilver, the mark fine is divided into 16 loths, and the loth into 18 grains.

LOTHAIRE I., in *Biography*, emperor of the Weſt, and king of Italy, eldeſt ſon of Lewis I., ſurnamed le Debonnaire, was born in 795. He was aſſociated with his father in the imperial dignity in 817, and was crowned king of Lombardy in 821. (See Lewis I.) On the death of his father he ſucceeded to the imperial dignity. Being confirmed in the title of emperor, he aimed at the poſſeſſion of the whole of his father's territories, and endeavoured to deprive, of their inheritance, his brothers Lewis and Charles, who aſſembled all their forces to vindicate their rights. This great family quarrel was decided on the plains of Fontenoy. The conflict was terrible, and the ground diſputed with an obſtinacy, of which few examples are left on record in the ſanguinary horrors of war. Hiſtorians agree in ſtating that a hundred thouſand men fell on this occaſion, and have in this inſtance applied the remark, "that whole generations may be ſwept away by the madneſs of kings in the ſpace of a ſingle hour." Lothaire was completely defeated, and obliged to betake himſelf to flight. He went to Aix-la-Chapelle, where he diligently exerted himſelf to repair his loſſes. The viciſſitudes of three ſucceſſive years of diſcord exhauſted at length the powers, without impairing the animoſity, of the kindred princes, and they conſented to divide thoſe dominions for which they were no longer able to contend. By this diviſion the French monarchy was divided into three ſhares, of which Lothaire, with the imperial dignity, retained Italy, with all the provinces ſituated between the Rhone, Rhine, Soane, Meuſe, and Scheldt. After this partition, Lothaire paſſed ſome years, diſquieted by the inroads of the Saracens upon Italy, and by differences with his half-brother Charles, till diſguſt with the cares of the world, and declining health induced him to abdicate his crown. The part of Gaul which Lothaire retained, he had diſtinguiſhed by his own name, Lotharingia, which, by the inſenſible corruption of time, has ſunk into that of Lorrain, which is ſtill annexed to the diſtrict. But the empire which he had purſued at the expence of every filial duty, and which he had eſtabliſhed by torrents of the beſt blood of his ſubjects, afforded him but a tranſient ſatisfaction. From the ſummit of grandeur which he had attained, the recollection of the paſt was melancholy and frightful, the proſpect of the future was dreary and comfortleſs, and fifteen years after the death of his father he aſſumed the habit of a monk; the ſhort ſpace of a few days only, however, was allowed to the prayers of the royal penitent, when he died in the ſixtieth year of his age. He left three ſons, *viz.* Lewis, Lothaire, and Charles: of whom the firſt inherited Italy, with the title of emperor; the ſecond, the kingdom of Lorrain; and the third that of Provence. Univer. Hiſt.

Lothaire II., or Lotharius, duke of Saxe-Supplemburg, was raiſed to the imperial throne, after the death of Henry V., in 1126, notwithſtanding the oppoſition of two powerful competitors, who made very vigorous exertions for the ſupport of their pretenſions. But after a ſanguinary and unavailing conteſt, they took the oath of allegiance, and were honoured with particular marks of their ſovereign's friendſhip. Lothaire was crowned at Aix-la-Chapelle, in preſence of the pope's nuncio. After he was quietly ſeated on his throne, he eſpouſed the cauſe of pope Innocent II. againſt the anti-pope Anacletus, and undertook an expedition into Italy, to re-eſtabliſh him in the papal chair. Lothaire was ſucceſsful, and the event fully anſwered his expectations. Innocent remunerated his ſervices by performing the ceremony of his coronation with great magnificence, but he had the art, at the ſame time, to make the emperor do homage to the holy ſee, of which the court of Rome availed itſelf to maintain that the empire was a fief of that ſee. Some time after theſe tranſactions, his holineſs was expoſed to imminent danger by an hoſtile incurſion of Roger, king of Sicily, but Lothaire advanced to his aſſiſtance, and Roger's inſult was puniſhed by the loſs of all his Italian poſſeſſions, and he himſelf was forced to retire into Sicily. Theſe provinces Lothaire formed into a principality, which he conferred upon Renaud, a German, one of his relations. On his return into Germany, Lothaire was ſeized with a dangerous diſtemper, which terminated his life in the twelfth year of his reign. By command of this emperor, the Juſtinian code of laws, which had been in diſuſe for more than five centuries, was revived in the empire. This reign was rendered remarkable by exceſſive heat and a great drought in Germany, which actually withered the corn and blaſted the fruits of the earth, dried up the moſt conſiderable rivers, and occaſioned a dreadful mortality among the cattle.

Lothaire, king of France, ſucceeded his father, Lewis d'Outremer, in 954, being only in the 14th year of his age. He was at firſt under the protection of Hugh, duke of France, but on the death of that prince, in the following year, he aſſumed the reins of government. In 959, he was perſuaded to enter into a treacherous plot for ſeizing the perſon of Richard, duke of Normandy, which failing of ſucceſs an open war broke out, and the duke, preſſed by the ſuperior forces of his antagoniſt, invited the Danes to his ſupport. France was accordingly afflicted by their indefatigable rapacity : independent and uncontrouled in their depredations, they refuſed to ſubſcribe the peace which Richard concluded, and their retreat was with difficulty purchaſed by the treaſures of France and Normandy. Lothaire had no ſooner diſengaged himſelf from this diſtreſs, than he attempted to oppreſs his vaſſal, the young count of Flanders, who was preſerved by the interpoſition of the Normans ; and the king, baffled in his endeavours to aggrandize himſelf by arms, flattered himſelf, with the hope of reſtoring the grandeur of the houſe of Charlemagne, by advantageous alliances. He accordingly eſpouſed Emma, the daughter of Lothaire, king of Italy, and beſtowed his ſiſter on Conrad, king of Burgundy, but the ſhort reſpite allowed by a peace was followed by years of deſolating war, and the poſſeſſion of Lorrain was diſputed, during four ſucceſſive campaigns, by the kings of Germany and France. At length Lothaire thought it adviſable to make peace, and leave the emperor in poſſeſſion of Lorrain. This treaty gave great diſguſt to the French nobles ; but the king found means to pacify or controul them ; and on the death of Otho, the emperor, he re-entered Lorrain, took the town of Verdun, and aſſaulted Cambray. When his affairs abroad were returning to a ſtate of great proſperity, and when his authority at home was acquiring ſtrength, he was ſuddenly ſurpriſed by the approach of death, whoſe power he was unable to reſiſt. He died at Rheims in the forty-ſixth year of his age, leaving his crown to his ſon Lewis V. Lothaire was unqueſtionably poſſeſſed of vigour and abilities, but he was inſincere, and almoſt always engaged in conteſts with his neighbours and vaſſals. Univer. Hiſt. Hiſt. of France, London, 1790.

LOTHAU, in *Geography*, a town of Germany, in the principality of Culmbach ; 9 miles S. of Culmbach.

LOTHIAN, an extenſive diſtrict of Scotland, divided into three parts ; *viz.* Eaſt-Lothian, or Haddingtonſhire. Mid-Lothian, or Edinburghſhire, and Weſt-Lothian, or Linlithgowſhire.

LOTHINGLAND, once an iſland, and part of the county of Suffolk, towards the German ocean, on the N.E. part of the county, and the moſt eaſtern part of Great Britain ; now a peninſula, joined to the mainland by a narrow neck near Loweſtoft, formed, as it has been ſuppoſed, about the year 1722. It is bounded on the N. by the river Yare, on the E. by the ſea, by a lake, called Lothing, on the S., and by the river Waveny on the W. From N. to S. it is in length more than ten miles, and ſix in breadth ; and contains ſixteen pariſhes, of which Loweſtoft is the principal and only market-town.

LOTICH, Peter, in *Biography*, ſurnamed *Secundus*, a diſtinguiſhed modern-Latin poet, was born, in 1528, in the county of Hanau, in Germany. He received the early part of his education at a convent in his native place, and purſued his maturer ſtudies at Frankfort, Marpurg, and Wittenburg, at which laſt place he contracted an intimacy with Melancthon and Camerarius. During the war in Saxony he ſerved a campaign in the army. In 1550 he viſited France with ſome young perſons to whom he was governor, and he continued there nearly four years. He afterwards went to Italy, where he had nearly been deſtroyed by poiſon prepared for another purpoſe : he recovered from the effects of it, but was ſubject to frequent relapſes, one of which carried him off in the year 1560. He had taken his degree of doctor of phyſic at Padua, and three years previouſly to his death was choſen profeſſor in that ſcience at Heidelberg. In that ſituation he was honoured with the friendſhip of the elector-palatine, and by the excellence of his diſpoſition, and the ſingular frankneſs and ſincerity of his character, rendered himſelf univerſally beloved. A collection of his Latin poems was publiſhed the year after his deceaſe, with a dedicatory epiſtle by Joachim Camerarius, who praiſes him as the beſt poet of his age : it has been very frequently reprinted. He had a younger brother Chriſtian, likewiſe a poet. A collection of his poems, with thoſe of his relation John Peter Lotich, was publiſhed in 1620. John Peter Lotich was a phyſician of eminence, who maintained the literary character of his family by a variety of writings. He was grandſon of the above-mentioned Chriſtian. He exerciſed his profeſſion at Minden and at Heſſe, and became profeſſor of medicine at Rintlen in Weſtphalia. He died very much regretted in 1652. His principal works are, "Conciliorum et Obſervationum Medicinalium ;" "Latin Poems :" "A Commentary on Petronius ;" and "A Hiſtory of the Emperors Ferdinand II. and III." in four volumes, is attributed to him.

LOTIERO, St., in *Geography*, a town of Naples, in Principato Ultra ; 15 miles E.N.E. of Benevento.

LOTINE, in the *Ancient Muſic*. Athenæus relates, in his Deipnos. that the flute entitled lotina was the ſame inſtrument as that which the Alexandrians termed *Photinga*, adding, that it was made of the wood of the lotos tree, which grew in Africa.

LOTION, Lotio, popularly called *waſh*, denotes a form of medicine, made up of liquid matters, chiefly uſed for beautifying the ſkin, and cleanſing it from thoſe deformities which a diſtempered blood ſometimes throws on it ; or rather, which are occaſioned by a preternatural ſecretion.

Lotion alſo denotes a remedy, poſſeſſing a medium between a fomentation and a bath.

There are refreſhing and ſomniferous lotions for feveriſh perſons, made of leaves, flowers, and roots boiled, with which the feet and hands of the patient are waſhed ; and after waſhing, wrapped up in linen, ſteeped in the ſame decoction till dry.

There are lotions alſo for the head and hair.

Lotion, in *Pharmacy*, denotes a preparation of medicines, by waſhing them in ſome liquid, either made very light, ſo as to take away only the dregs ; or ſharp, ſo as to penetrate them, in order to clear them of ſome ſalt, or corroſive ſpirit, as is done to antimony, precipitates, magiſteries, &c. &c.; or intended to take away ſome foulneſs, or ill quality ; or to communicate ſome good one.

Lotion, *Saponaceous*, *Lotio ſaponacea*, the name of a form of medicine preſcribed in the late London pharmacopeia, being properly ſoap in a liquid form. It is ordered to be made thus : Take damaſk roſe-water, three quarters of a pint ; oil of olives, a quarter of a pint ; ley of tartar, half an ounce in meaſure : rub the ley and oil together till they are mixed, and then gradually add the water.

LOTOMETRA, in *Botany*, a name given by many of the ancients to the nymphæa Indica, or Ægyptiaca, called alſo the faba Ægyptiaca, and originally the *nilufar*, an abbreviation of *nilnufar ; nufar* ſignifying a water-lily, and the prefix *nil* expreſſing its growing particularly in the river Nile.

Neophytus tells us, that this lotometra has leaves of a middle form between thoſe of the common nymphæa, which are roundiſh, and thoſe of the arum, which are oblong and pointed, and are cordated at the baſe ; and this is the very figure of the leaves of the faba Ægyptiaca, as we ſee it in all paintings, &c.

LOTOS (ſee Lotus) is held in the higheſt veneration in India, incluſive of Thibet and Nepaul. Among the Brahmans and enthuſiaſtic Hindoos, no object in nature is looked on with more ſuperſtition ; and their books abound with myſtical alluſions to this lovely aquatic. Being eſteemed the moſt beautiful of vegetables, it not unappropriately furniſhes a name for the Hindoo queen of beauty, and *Kamal* or *Kamala* is, as noticed under that article, a name of Lakſhmi ; as is Padma or Pedma, another Sanſcrit appellation for both. (See Lakshmi.) Under the form of Kamala, Lakſhmi is uſually repreſented with a lotos in her hand, and in moſt pictures and ſtatues of her conſort Viſhnu, he is furniſhed with the Pedma, or lotos bud, in one of his four hands, as a diſtinguiſhing attribute. Accordingly, as it is repreſented in different ſtages of efflorеſcence, it varies, in the eye of myſtics, its emblematical alluſions. As an aquatic, the lotos is a ſymbol alſo of Viſhnu, he being a perſonification of water or humidity, and he is often repreſented ſeated on it. Brahma, the creative power, is alſo ſometimes ſeated on the lotos, and is borne on its calyx in the whimſical repreſentation of the renovation of the world, when this myſtical plant iſſued out of the navel of Viſhnu from the bottom of the ſea, where he was repoſing on the ſerpent Seſha. (See Sesha.) The following extract from the curious and learned diſſertation of Major Wilford, "On the ſacred Iſles of the Weſt," will ſerve to ſhew the wild extravagance of Hindoo mythologiſts. "The nymphæa, or lotos, floating on the water, is an emblem of the world ; the whole plant ſignifies both the earth and its two principles of fecundation. The ſtalk originates from the navel of Viſhnu, ſleeping at the bottom of the ocean ; and the flower is the cradle of Brahma, or mankind. The germ is both Meru and the Linga ; the petals and filaments are the mountains which encircle Meru, and are alſo the type of the Yoni." (Aſiatic Reſearches, vol. viii.) This may ſuffice as to the extravaganzas of Hindoo myſtics. The reader may ſee farther hereon under our articles Linga, Meru, and Yoni. Hindoo poetry alſo ſuperabounds in alluſions to the lotos. One alluſion, connected with an intereſting fact in natural hiſtory, we will notice. In the northern parts of India the petals of the lotos are blue, as well as red and white ; while in the ſouthern provinces the blue flower is not ſeen ; the poets have hence feigned that the crimſon hue was imparted to it by the blood of Siva iſſuing from the wound made by the arrow of Kama, when the god of love daringly endeavoured to inſpire the "king of dread" with an amorous paſſion, for which preſumption he was reduced to aſhes, or, as ſome ſay, to a mental eſſence, by the fire which iſſued from the forehead of the "three-eyed god." (See Kama and Siva.) In the Hindoo Pantheon, neceſſarily compriſing a great maſs of myſticiſm in its mythological details, the reader will find many particulars and plates connected with the ſubjects of this article.

LOTTERY, a kind of game of hazard, wherein ſeveral lots of merchandize, or ſums of money, are depoſited as prizes, for the benefit of the fortunate.

The deſign of lotteries, and the manner of drawing them, are too well known among us to need a deſcription : they are very frequent in England and Holland, where they cannot be ſet on foot without the permiſſion of the magiſtrate.—In France too, there have been ſeveral lotteries in favour of their hoſpitals.

M. Le Clerc has compoſed a treatiſe of lotteries, wherein is ſhewn what is laudable, and what blameable in them.—Gregorio Leti has alſo a book on the ſubject of lotteries. Father Meneſtrier has a treatiſe on the ſame, publiſhed in 1700, where he ſhews their origin and uſe among the Romans. He diſtinguiſhes ſeveral kinds of lotteries, and takes occaſion to ſpeak of chances, and reſolves ſeveral caſes of conſcience relating thereto. See ſeveral ſtatutes relating to lotteries under the article Gaming.

An act paſſed in 1778, for regulating the conduct of the lottery, reſtrains any perſon from keeping an office for the ſale of tickets, ſhares, or chances, or for buying, ſelling, inſuring, or regiſtering, without a licence ; for which licence each office-keeper muſt pay 50*l.*, if it be in, or within twenty miles of London, Edinburgh, or Dublin, and 10*l.* for every licence for every other office, to continue in force for one year, and the produce to be applied towards defraying the expences of the lottery. And no perſon is allowed to ſell any ſhare or chance leſs than a ſixteenth, on the penalty of 50*l.* All tickets divided into ſhares or chances are to be depoſited in an office, to be eſtabliſhed in London by the commiſſioners of the treaſury, who are to appoint a perſon to conduct the buſineſs thereof ; and all ſhares are to be ſtamped by the ſaid officer, who is to give a receipt for every ticket depoſited with him. The numbers of all tickets ſo depoſited are to be entered in a book, with the names of the owners, and the number of ſhares into which they are divided ; and two-pence for each ſhare is to be paid to the officer on depoſiting ſuch tickets, who is therewith to pay all expences incident to the office. All tickets depoſited in the office are to remain there three days after the drawing. And any perſon keeping an office, or ſelling ſhares, or who ſhall publiſh any ſcheme for receiving monies in conſideration of any intereſt to be granted in any ticket in the ſaid lottery, &c. without being in poſſeſſion of ſuch ticket, ſhall forfeit 500*l.* and ſuffer three months impriſonment. And no buſineſs is to be tranſacted at any of the offices after eight in the evening, except on the evening of the Saturday preceding the drawing. No perſon is to keep any office for the ſale of tickets, &c. in Oxford or Cambridge, on penalty of 20*l.* Before this regulating ſtatute took place, there were upwards of 400 lottery offices in and about London only ; but the whole number afterwards, for all England, as appeared by the liſt publiſhed by authority, amounted to no more than 51. They are, however, at this time much more numerous.

By 42 Geo. III. c. 119, all games or lotteries called little-goes are declared public nuiſances, and all perſons keeping an office or place for any game or lottery not authorized by law, ſhall forfeit 500*l.* and be deemed rogues and vagabonds. The proprietor of a whole ticket may nevertheleſs inſure it for its value only, with any licenſed office for the whole time of drawing, from the time of inſurance, under a *bonâ fide* agreement, without a ſtamp. The laſt ſtate lottery act enacting various new regulations was 49 Geo. III. c. 94.

The propoſals for the firſt public lottery of which we have any account were publiſhed in 1567 and 1568, and it was drawn in 1569, at the weſt door of St. Paul's cathedral. The tickets were ſold at ten ſhillings each, and there were no blanks. The prizes conſiſted chiefly of plate, and the profits of it were intended for repairing the havens of the kingdom, and other public works. In 1612, James I. granted permiſſion for a lottery to be held alſo at the weſt end of St.

22 Geo. III. c. 47, and renewed in the lottery acts in 1802, and the three following years, but omitted in thoſe of 1806 and 1807, ought in future to be re-enacted, without the exception therein made, to Saturday evenings."

Theſe ſuggeſtions have been attended to in the lotteries of the laſt two or three years, which have been ſeveral of them drawn in one day, and conſequently a conſiderable check has been given to illegal inſurances. Still, however, many evils remain, which are ſo blended with the nature of lotteries, that it is impoſſible to ſeparate them, and it may fairly be queſtioned, whether, for the ſake of a ſort of voluntary tax, which is thus impoſed upon ignorance and folly, the morals of many induſtrious and honeſt members of ſociety ought to be expoſed to the danger of being enſnared by the deluſive hopes of gain, which the lottery ſchemes are calculated to inſpire. With regard to the advantage that the revenue derive from the lottery ſyſtem, it may likewiſe be collected from the reported account above alluded to. Mr. Shewell informed the committee, that the general advance put upon tickets by the contractor, was about 3*l. per* ticket, not varying much under or over. This is in conſideration of the certain loſs on ſuch tickets as the contractor is not able to ſell, the expence he muſt neceſſarily be put to in the ſale of his lottery, and the profit that he naturally expects on ſuch a concern. The lottery is conſidered as ſold pretty well, of which four-fifths of the tickets are diſpoſed of: the contractors of the lottery in hand, at the time of this enquiry, expected not to ſell more than 17,000 tickets out of the 25,000, of which it conſiſted. The tickets in this lottery were ſold by the chancellor of the exchequer at 17*l.* and a fraction, the tickets of which were not worth quite 10*l.* each; the contractor ſold it again to the licenſed lottery-office keepers at 20*l.* 19*s. per* ticket, between three and four pounds more than they gave for it. The lottery-office keeper puts on another profit, which, in thoſe numbers divided in eighths, ſixteenths, &c. amounts to about 1*l. per* ticket; whence it is obvious, that the adventurer in this lottery (and this may be conſidered as an average of lotteries in general), gamble at a diſadvantage of 100 *per cent.* Government is a gainer of about 70 *per cent.*, beſides about 20 *per cent.* farther, which is ſuppoſed to be added to the revenue by the poſtage of letters, ſtamps, duties on advertiſements, exciſe duty, on candles, paper, &c. On the face of the concern there appears, therefore, a conſiderable profit to government, which, at a mean, may be eſtimated at about 750,000*l. per annum;* but it was the opinion of thoſe who are beſt qualified to judge of theſe ſubjects, that this increaſe of revenue was rather apparent than real; that the extra parochial taxes, brought on by the diſtreſs they occaſion; the decreaſed conſumption of exciſeable articles, juſt before, and during the time the lottery is drawing, and for a few weeks afterwards, which decreaſe was actually aſcertained from competent witneſſes, fully counterbalance the apparent gain. Should this be the true ſtate of the caſe, what can induce the miniſters to continue to give their ſanction to ſuch deluſive and dangerous ſpecies of gambling? At all events, if the above profit were real, no revenue is obtained by the ſtate at half the expence, in point of pecuniary ſacrifice to the public, independent of the exceſſive injury to the morals of the people. We have already ſeen, that the purchaſers of legal ſhares gamble at the diſadvantage of 100 *per cent.*; and the inſurances are carried on, to the diſadvantage of the public, at about 40 *per cent.*; but ſtill it is not eaſy to eſtimate the annual expence which lotteries coſt the public; the following ſtatement, however, is hazarded by P. Colquhoun, eſq. and ſubmitted to the above-mentioned committee.

		£.
Suppoſe three annual lotteries, each of 25,000 tickets, the public receives - -		600,000
Contractors profit at 1*l. per* ticket - -		75,000
Lottery-office keeper's profit - - -		100,000
Inſurer's profit $33\frac{1}{2}$ *per cent.* on 1,000,000*l.* -		333,000
Total		£.1,108,000
The public are ſuppoſed to pay for 75,000 tickets, including the additional advance on halves, quarters, &c. - - -		1,275,000
The lower claſs who inſure are ſuppoſed to pay - - - - -		1,000,000
		£.2,275,000
	£.	
Deduct prizes - -	750,000	
Deduct prizes obtained by inſurers	250,000	
		1,000,000
Loſs to the public to gain 600,000*l.* to the revenue yearly - - - -		1,275,000

This eſtimate ſeems to have been made upon the moſt favourable ſuppoſitions, and probably falls conſiderably ſhort of the real loſs ſuſtained by the public.

The following is an account of the prices of tickets, and immediate profit derived from them by the ſtate, during the ſix years from 1802 to 1807.

Year.		No. of Tickets.	Price.	Profit.
1802		100,000	£.14 11 0	£.555,000
1803		80,000	13 13 1	352,333
1804				
——	1	25,000	14 15 6	119,375
——	2	25,000	15 16 0	145,000
——	3	30,000	15 13 6	170,250
				£.434,625
1805				
——	1	25,000	17 2 9	178,473
——	2	25,000	18 3 0	203,750
——	3	25,000	17 18 9	198,437
				£.580,660
1806				
——	1	20,000	16 12 0	132,000
——	2	25,000	16 14 3	167,812
——	3	25,000	16 10 0	162,500
——	4	20,000	16 19 0	139,000
				£.601,312
1807				
——	1	20,000	17 13 6	153,000
——	2	25,000	17 4 0	180,000
——	3	25,000	16 10 6	163,125
				£.496,125

To theſe ſums are to be added the advantages derived from poſtages, ſtamps, &c. which are generally eſtimated at 2*l. per* ticket, making the mean annual profit about 750,000*l.* But after deductions are made for the loſſes ſuſtained from cauſes connected with the lottery ſyſtem, it is doubtful whether any real advantage is derived from this ſource; and if even the whole of the above was a real ſaving, the evils attending it are ſuch as to lead us to hope, that miniſters will find ſome other means of raiſing an equivalent, founded upon more liberal principles, and leſs dangerous to the morals and happineſs of the people.

Having ſaid thus much with regard to the general policy of lotteries, we ſhall conclude the preſent article by an inveſtigation of the theory of lotteries, as it is connected with the doctrine of chances.

PROB. I.

Any number of things being given, as a, b, c, d, e, f; to find the probability that in taking three of them, as they happen, they ſhall be any three propoſed, as a, b, c.

Firſt, the probability of taking either a or b, or c, will be $\frac{3}{6}$ths, and ſuppoſing one of them, as a, to be taken, then the probability of taking either b or c will be $\frac{2}{5}$ths. Again, let either of them be taken, ſuppoſe b; the probability of taking c in the third place will be $\frac{1}{4}$th; wherefore the probability of taking the three things propoſed, *viz.* a, b, c, will be

$$\frac{3}{6} \times \frac{2}{5} \times \frac{1}{4} = \frac{1}{20}.$$

Otherwiſe, we might conſider what number of combinations of ſix things can be formed by taking three at a time; and out of this number there is obviouſly only one combination that anſwers the conditions of the problem propoſed; and there are, therefore, ſo many chances to one againſt the ſucceſs of the trial.

Now, the number of ſuch combinations is expreſſed by

$$\frac{6 \times 5 \times 4}{3 \times 2 \times 1} = 20.$$

And, conſequently, the chance of drawing the ſpecified things a, b, c, is $\frac{1}{20}$th, as before.

Corollary.—Univerſally, the number of combinations that can be formed, of n things taking p, at a time, is expreſſed by

$$\frac{n \cdot (n-1)\ (n-2)\ (n-3) \ldots (n-p)}{p\ (p-1)\ (p-2)\ (p-3) \ldots\ldots 1}$$

and conſequently, the reciprocal of this fraction will be the probability of ſucceſs in any caſe that may ariſe.

PROB. II.

Let the ſame ſix things be propoſed as above, to determine the probability, that in drawing four of them, the three ſpecified ones, as a, b, c, ſhall be taken.

Firſt, the number of combinations that can be formed of ſix things, taking three at a time, is $\frac{6 \times 5 \times 4}{3 \cdot 2 \cdot 1} = 20$: and the number of combinations that can be formed out of four things, taking three at a time, is $\frac{4 \times 3 \times 2}{3 \times 2 \times 1} = 4$. Whence it follows that out of the twenty combinations of threes which may happen, four of them will be in hand; and, therefore, the probability of taking the three ſpecified things under the condition of the problem, is $\frac{4}{20} = \frac{1}{5}$.

And hence, generally, to determine the probability, that in drawing out of a given number of tickets n, any propoſed number p, there ſhall be found amongſt them any number of ſpecified ones q, we muſt divide the firſt of the following ſeries by the ſecond, *viz.*

$$1.\quad \frac{p\ (p-1)\ (p-2)\ (p-3) \ldots (p-q)}{q\ (q-1)\ (q-2)\ (q-3) \ldots\ldots\ldots 1}$$

$$2.\quad \frac{n\ (n-1)\ (n-2)\ (n-3) \ldots (n-q)}{q\ (q-1)\ (q-2)\ (q-3) \ldots\ldots\ldots 1}$$

that is, the propoſed chance will be expreſſed by the fraction

$$\frac{p\ (p-1)\ (p-2)\ (p-3) \ldots (p-q)}{n\ (n-1)\ (n-2)\ (n-3) \ldots (n-q)}.$$

PROB. III.

To find what probability there is, that in taking at random ſeven counters out of twelve, whereof four are white, and eight black, there ſhall be at leaſt three white ones.

1. Find the chance for taking three white out of four, which will be

$$\frac{4 \times 3 \times 2}{3 \times 2 \times 1} = 4.$$

2. The number of chances for taking four black out of eight is, on the ſame principle, found to be

$$\frac{8 \times 7 \times 6 \times 5}{4 \times 3 \times 2 \times 1} = 70.$$

And, therefore, the chances of both ſucceeding is $4 \times 70 = 280$.

But by the queſtion, he may hold four white and three black, becauſe it is only limited that three white be taken, and not that there ſhould be three white and no more.

3. How the number of chances for taking four white out of four is one.

4. The number of chances for taking three black out of eight is

$$\frac{8 \times 7 \times 6}{3 \times 2 \times 1} = 56.$$

And the product of theſe two is $56 \times 1 = 56$, therefore the whole number by which the event may ſucceed, is $280 + 56 = 336$.

5. But the whole number of combinations that can be formed out of twelve things, taking ſeven at a time, is

$$\frac{12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6}{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = 792:$$

therefore $\frac{336}{792} = \frac{14}{33}$, will expreſs the probability that the event will happen, and conſequently $1 - \frac{14}{33} = \frac{19}{33}$, is the probability of its failing; that is, the odds againſt three white counters being drawn, are as 19 to 14.

Corollary.—Let a be the number of white counters, b the number of black, n the whole number $= a + b$; c the number of counters to be taken out of the number n: alſo, let p repreſent the number of white counters that are to be found preciſely in c. Then the number of chances for taking none of the white, or one of the white, or two of the white, and no more; or three of the white and no more; or four of the white and no more, &c. will be expreſſed as follows:

$$\left\{\frac{a}{1} \times \frac{a-1}{2} \times \frac{a-2}{3} \times \frac{a-3}{4}\ \text{\&c.}\right\} \times$$
$$\left\{\frac{b}{1} \times \frac{b-1}{2} \times \frac{b-2}{3} \times \frac{b-3}{4}\ \text{\&c.}\right\}$$

The number of terms in which a enters being equal to the number p; and the number of terms in which b enters being equal to the number $c - p$.

But the number of all the chances for taking a certain number c, of counters out of the number n, is expreſſed by

$$\frac{n}{1} \times \frac{n-1}{2} \times \frac{n-2}{3} \times \frac{n-3}{4} \text{ \&c.}$$

to be continued to as many terms as there are units in c.

If the numbers n and c were large, ſuch as $n = 40000$, and $c = 8000$, the foregoing method would ſeem impracticable, on account of the great number of terms to be taken in both ſeries, whereof the firſt is to be divided by the ſecond; though if thoſe terms were actually ſet down, a great many of them being common diviſors might be expunged out of both ſeries; for which reaſon it will be convenient to uſe the following theorem, which is a contraction of that method, and which will be chiefly of uſe when the white counters are but few. Let, therefore, n be the number of all the counters, a the number of white, b the number of black, c the number of counters to be taken out of the number n, p the number of white that are to be taken preciſely, then making $n - c = d$. The probability of taking preciſely the number p of white counters will be as follows: *viz.* making

$$c \cdot (c-1)\ (c-2)\ (c-3) \text{ \&c.} = C$$
$$d \cdot (d-1)\ (d-2)\ (d-3) \text{ \&c.} = D$$
$$\frac{a}{1} \times \frac{a-1}{2} \times \frac{a-2}{3} \times \frac{a-3}{4} \text{ \&c.} = A$$
$$n\ (n-1)\ (n-2)\ (n-3) \text{ \&c.} = N$$

the probability $= \dfrac{C \times D \times A}{N}$:

where it is to be obſerved, that the firſt and third ſeries contain as many terms as there are units in p; the ſecond as many as there are in $a - p$; the fourth as many as there are in a.

Let us now apply theſe reſults in the ſolution of the following problems.

Prob. IV.

In a lottery conſiſting of 40000 tickets, among which are three particular benefits, what is the probability that taking 8000 of them, one or more of the particular benefits ſhall be among them. Subſtitute 8000, 40000, 32000, 3, and 1 reſpectively for c, n, d, a, and p, in that problem; and the probability of taking preciſely one of the three particular benefits will appear to be $\dfrac{8000 \times 32000 \times 31999 \times 3}{40000 \times 39999 \times 39998} = \dfrac{48}{125}$ nearly. If $p = 2$, the probability of taking preciſely two of the particular benefits will be $\dfrac{8000 \times 7999 \times 32000 \times 3}{40000 \times 39999 \times 39998} = \dfrac{12}{125}$ nearly. If $p = 3$, the probability of taking all the three particular benefits will be $\dfrac{8000 \times 7999 \times 7998}{40000 \times 39999 \times 39998} = \dfrac{1}{125}$. And the probability of taking one or more of the three particular benefits will be $\dfrac{48 + 12 + 1}{125} = \dfrac{61}{125}$ very nearly. Theſe three operations might have been contracted into one by inquiring the probability of not taking any of the three particular benefits, which will be found to be $\dfrac{32000 \times 31999 \times 31998}{40000 \times 39999 \times 39998} = \dfrac{64}{125}$ nearly, which being ſubtracted from unity, gives a remainder, $1 - \dfrac{64}{125} = \dfrac{61}{125}$, ſhewing the probability required; and therefore the odds againſt taking any of three particular benefits will be 64 to 61 nearly.

Prob. V.

To find how many tickets ought to be taken in a lottery conſiſting of 40000, among which are three particular benefits, to make it as probable that one or more of theſe three may be taken as not. Let the number of tickets requiſite to be taken be $= x$, and the probability of not taking any of the particular benefits will be $\dfrac{n-x}{n} \times \dfrac{n-x-1}{n-1} \times \dfrac{n-x-2}{n-2}$; but this probability is equal to $\frac{1}{2}$, ſince by hypotheſis, the probability of taking one or more of them is equal to $\frac{1}{2}$; whence we ſhall have the equation $\dfrac{n-x}{n} \times \dfrac{n-x-1}{n-1} \times \dfrac{n-x-2}{n-2} = \frac{1}{2}$, from the ſolution of which x will be found nearly equal to 8252. The terms of this equation, M. De Moivre obſerves, may be conſidered as being in geometric progreſſion; ſince the factors both of the numerator and denominator are few and in arithmetic progreſſion, and their difference very ſmall in reſpect of n: and, therefore, the cube of the middle term may be ſuppoſed equal to the product of the multiplication of theſe terms; whence will ariſe the equation, $\left|\overline{\dfrac{n-x-1}{n-1}}\right|^3 = \frac{1}{2}$; or, neglecting the unit both in the numerator and denominator, $\left|\overline{\dfrac{n-x}{n}}\right|^3 = \frac{1}{2}$, and x, conſequently, $= n\ (1 - \sqrt[3]{\tfrac{1}{2}})$, or $n\ (1 - \frac{1}{2}\sqrt[3]{4})$: but $n = 40000$, and $1 - \frac{1}{2}\sqrt[3]{4} = 0.2063$; therefore $x = 8252$.

Prob. VI.

To determine accurately, in a lottery of 100000 tickets, whereof 90000 are blanks, and 10000 are benefits, what the odds are of taking or not taking a benefit, in any number of tickets aſſigned. Let the number be 6; and it will appear, by the above cited problem, that the number of chances for taking no prize in 6 tickets, making $a = 10000$, $b = 90000$, $c = 6$, $p = 0$, $n = 100000$, will be $\dfrac{90000}{1} \times \dfrac{89999}{2} \times \dfrac{89998}{3} \times \dfrac{89997}{4} \times \dfrac{89996}{5} \times \dfrac{89995}{6}$; and that the whole number of chances will be $\dfrac{100000}{1} \times \dfrac{99990}{2} \times \dfrac{99998}{3} \times \dfrac{99997}{4} \times \dfrac{99996}{5} \times \dfrac{99995}{6}$; then dividing the firſt number of chances by the ſecond, by means of logarithms, the quotient will be 0.53143, the probability required: this decimal fraction being ſubtracted from unity, the remainder 0.46857 ſhews the probability of taking one prize or more in ſix tickets; wherefore the odds againſt taking any prize in ſix tickets will be 53143 to 46857. If the number of tickets be ſeven, then carrying each number of chances above written one ſtep farther, we ſhall find that the probability of taking no prize in ſeven tickets is 0.47828, which ſubtracted from unit leaves a remainder 0.52172, which ſhews the odds of taking one prize or more in ſeven tickets to be 52172 to 47828.

PROB. VII.

With the ſame data, to find the value of the chance of a prize, ſuppoſing each ticket to be 10*l.*, and that after the lottery is drawn, 7*l.* 10*s.* be returned to the blanks. There being 90000 blanks, to each of which is returned 7*l.* 10*s.* the total value of the blanks is 675,000*l.* and conſequently the total value of the benefits is 325,000*l.* which being divided by 10000, the number of benefits, gives a quotient 32*l.* 10*s.* and, therefore, one might for the ſum of 32*l.* 10*s.* be entitled to have a benefit certain, taken at random out of the whole number of benefits: the purchaſer of a chance has, therefore, one chance in ten for the ſum of 32*l.* 10*s.* and nine chances in ten for loſing his money; from whence it follows, that the value of his chance is the tenth part of 32*l.* 10*s.* *viz.* 3*l.* 5*s.* And conſequently the purchaſer of a chance, by giving the ſeller 3*l.* 5*s.*, is intitled to the chance of a benefit, and ought not to return any thing to the ſeller, although he ſhould have a prize; for the ſeller having 3*l.* 5*s.* ſure, and nine chances in ten for 7*l.* 10*s.* the value of which chance is 6*l.* 15*s.* it follows that he has his 10*l.* 5*s.*

PROB. VIII.

In the ſame kind of lottery, let A engage to furniſh B with a chance, on condition that whenever the ticket on which the chance depends ſhall happen to be drawn, whether it proves a blank or prize, A ſhall furniſh B with a new chance, and ſo on, as often as there is occaſion, till the whole is drawn; it is propoſed to find what conſideration B ought to give A before the lottery begins to be drawn, for the chance or chances of one or more prizes, admitting that the lottery will be forty days in drawing.

Let the abſolute value of a chance, or 3*l.* 5*s.*, be called s. Firſt A, who is the ſeller, ought to conſider, that on the firſt day he furniſhes neceſſarily a chance whoſe value is s.

2dly. That on the ſecond day, he does not neceſſarily furniſh a chance, but conditionally, *viz.* if it ſo happen that the ticket on which the chance depends ſhould be drawn on the firſt day; but the probability of its being drawn on the firſt day is $\frac{1}{40}$; and therefore he ought to take $\frac{1}{40}s$ for the conſideration of the ſecond day.

3dly. That in the ſame manner he does not neceſſarily furniſh a chance on the third day, but conditionally, in caſe the only ticket depending (for there can be but one) ſhould happen to be drawn on the ſecond; of which the probability being $\frac{1}{39}$, by reaſon of the remaining 39 days from the ſecond incluſive to the laſt, it follows, that the value of that chance is $\frac{1}{39}s$.

4thly. And for the ſame reaſon the value of the next is $\frac{1}{38}s$, &c. the purchaſer ought, therefore, to give the ſeller $1 + \frac{1}{40} + \frac{1}{39} + \frac{1}{38} + \frac{1}{37} \cdot \cdot \cdot \cdot \cdot + \frac{1}{2} \times s$, or $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} \cdot \cdot \cdot \cdot \cdot + \frac{1}{40} \times s$. The ſum of theſe forty terms, being 4.2785 nearly, multiplied by s or 3.25, will give a product 13.9, ſhewing that the purchaſer ought to give the ſeller about 13*l* 18*s*.

From what has been ſaid it appears, that the value of the chance s for one ſingle day that ſhall be fixed upon is the value of that chance divided by the number of days intercepted between that day incluſive and the number of days remaining to the end of the lottery; which, however, muſt be underſtood with this reſtriction, that the day fixed upon muſt be choſen before the lottery begins; or if it be done on any other day, the ſtate of the lottery muſt be known, and a new calculation made accordingly for the value of s. De Moivre's Doctrine of Chances, 1756. See alſo the article CHANCES.

LOTTERY is alſo the name of a well-known game at cards.

LOTTI, ANTONIO, of Venice, in *Biography*, principal organiſt of St. Mark, and afterwards maeſtro di cappella of the ſame cathedral, was one of the greateſt men of his profeſſion. The celebrated Haſſe, his diſciple and intimate friend, and the beſt able to judge of his abilities, thought that none of the great maſters ever united in their works ſo great a ſhare of expreſſion and ſcience. In his compoſitions, he combined with the learning of the old ſchool all the grace, rich harmony, and brilliancy of the new. He was the hero of Haſſe, who never ſpoke of him but with rapture. "What expreſſion" (he uſed to ſay), "what variety, were in that expreſſion, and what truth in the ideas!" How pleaſing it was to hear a man at his time of life, of a merit and reputation above all envy, ſpeak with ſuch enthuſiaſm of a great maſter. Lotti was long at the head of the Venetian ſchool. His eccleſiaſtical compoſitions were only uſed at St. Mark's on great and ſolemn occaſions. They are truly ſublime. The kind of pathos in his ſtyle elevates the ſoul, and expreſſes all the grandeur and reverence of devotion. (Eſſais ſur la Muſ. tom. iii.) This animated and feeling character of Lotti does not ſeem to come from an author who in general ſpeaks of the Italians with contempt, and of Rameau as the only muſician who ever knew harmony and how to uſe it. We can, however, anſwer for the truth of the above character. For though we have never heard or ſeen any of his dramatic muſic, yet, in 1770, we heard at Venice, in the church of San Giovanni e Paulo, on a day that the doge went in proceſſion to that church, a maſs by Lotti, in four parts, without any other inſtrument than the organ, which was ſo well ſung and accompanied, that we do not remember ever to have received more pleaſure from choral muſic; all was correct, clear, and diſtinct; no confuſion or unneceſſary notes; it was even capable of expreſſion, particularly one of the movements into which the performers entered ſo well as to render it affecting even to tears. The organiſt, very judiciouſly, ſuffered the voices to be heard in all their purity, with which our attention was ſo occupied, that we frequently forgot that they were accompanied. This kind of muſic, á cappella, though exploded as unfit for theatrical purpoſes, muſt be allowed to have its merit. Lotti was the diſciple of Legrenzi, the model of Haſſe, one of the maſters of Marcello, Galuppi, and Peſcetti. His name is chiefly known in England by the diſpute in the Academy of Ancient Muſic, at the Crown and Anchor, in 1732, concerning a madrigal which Bononcini was accuſed of having ſtolen from him. See BONONCINI.

Lotti compoſed for the Venetian theatres, between the years 1698 and 1717, fifteen operas. His cantatas furniſh ſpecimens of recitative that do honour to his ſenſibility. He was opera compoſer at the court of Dreſden when the Santa Stelli, his wife, performed the part of firſt woman then, in 1718; and in 1720 he returned to Venice, where he was living in 1733.

LOTUL, in *Geography*, a town of Bengal; 16 miles W. of Torea.

LOTUS, in *Botany*, a name which has been more variouſly

riouſly applied, and of which perhaps more has been written, than of any other plant. Thoſe who have ſought for its origin in the Greek language, have found nothing nearer than λω, *to will or deſire*, alluding, as they ſuppoſe, to the plant being greatly eſteemed. Others have thought, with more probability, that λωτος of the Greeks, and *Lotus* of the Latins, had one common Egyptian origin, its etymology being therefore, of courſe, inſcrutable to us. All that can be ſaid of the application of this name, at various times, and in various languages and nations, is, that it has always been uſed for ſome plant eminently uſeful as food, for man or beaſt. Thus it has been appropriated to the κυαμος, or Sacred Bean of India (ſee CYAMUS); and to its Egyptian ſubſtitute, the *Nymphæa;* to ſome African fruit, on which certain people have chiefly depended for their ſupport; and to ſeveral herbaceous plants, eſſential to the maintenance of domeſtic cattle, in countries ſparingly furniſhed with graſs. In this laſt ſenſe it is finally retained, as a generic appellation, by modern botaniſts.—Linn. Gen. 388. Schreb. 509. Willd. Sp. Pl. v. 3. 1385. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 793. Ait. Hort. Kew. ed. 1. v. 3. 90. Juſſ. 356. Lamarck. Illuſtr. t. 611. Gærtn. t. 153.—Claſs and order, *Diadelphia Decandria.* Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, tubular, nearly cylindrical, cut half way down into five, acute, erect teeth, equal in length, but not quite uniform in poſition, permanent. *Cor.* Papilionaceous. Standard roundiſh, bent backwards; its claw long, concave. Wings roundiſh, ſhorter than the ſtandard, broad, ſlightly cohering by their upper margin. Keel gibbous beneath, cloſed above, pointed, aſcending, ſhort. *Stam.* Filaments in two ſets, one ſimple, the other in nine ſegments, aſcending, rather dilated at the tips; anthers ſmall, ſimple. *Piſt.* Germen oblong, ſtraight, nearly cylindrical, rarely angular; ſtyle ſimple, aſcending; ſtigma a ſmall inflexed point. *Peric.* Legume cylindrical, ſtraight, tumid, longer than the calyx, of one cell and two valves. *Seeds* ſeveral, ſomewhat cylindrical.

Eſſ. Ch. Legume cylindrical, ſtraight. Wings cohering longitudinally above. Calyx tubular. Filaments dilated upwards.

The habit of this genus, moſtly herbaceous, in ſome inſtances ſlightly ſhrubby, approaches that of *Medicago*, but their fructification differs eſſentially. The ſpecies chiefly abound in the more temperate climates of Europe, or part of Africa. Seventeen occur in the *Sp. Pl.* of Linnæus, 18 in *Syſt. Veg ed.* 14; 30 in Willdenow. Three are reckoned natives of Britain, all confounded till lately under *L. corniculatus.*

The whole are diſtributed into two ſections.

Sect. 1. *Flowers, or legumes, one or two on a ſtalk, rarely three.*—Of theſe ſome of the principal are

L. *ſiliquoſus.* Square-podded Bird's-foot Trefoil. Linn. Sp. Pl. 1089. Jacq. Auſtr. t. 361. (L. tetragonolobus; Rivin. Tetrap. Irr. t. 79. L. trifolia corniculata; Ger. em. 1198.)—Legumes ſolitary, with four membranous wings. Stems procumbent. Bracteas lanceolate, ſolitary or ternate.—Native of rather moiſt paſtures, in various parts of the continent of Europe from Sweden to Italy, but not found in Britain. The *roots* are perennial, throwing up many weak decumbent *ſtems*, about a ſpan long, branching, zigzag and leafy. *Leaves* alternate, ſtalked, ternate; leaflets obovate, equal in length, but the two lateral ones very unequally divided by their rib; all ſomewhat fleſhy, more or leſs hairy, ſlightly glaucous beneath. *Stipulas* in pairs at the baſe of each footſtalk, large, ovate or elliptical. *Flower-ſtalks* few, axillary, ſolitary, about the tops of the ſtems, which they greatly overtop, being often three or four inches long, firm, hairy, ſingle-flowered. *Flowers* large, lemon-coloured. *Legume* an inch and half long, with four narrow wings.—Linnæus's *L. maritimus* is not even a variety of this. He ſeems at one time not to have been clear in his ideas reſpecting *ſiliquoſus* and *tetragonolobus*.

L. *tetragonolobus.* Crimſon Winged-Pea. Linn. Sp. Pl. 1089. Curt. Mag. t. 151. (L. ſiliquâ quadratâ; Ger. em. 1198.)—Legumes ſolitary, with four membranous wavy wings. Stems ſpreading. Bracteas ovate, ternate.—Native of Sicily and Spain. Very commonly cultivated as a hardy annual, for the ſake of its deep-crimſon, velvety flowers, and ſometimes for its pods, which when young are occaſionally eaten boiled, as greens. It is alſo celebrated in botanic hiſtory, as having firſt called the attention of Linnæus to the ſleep of plants. He obſerved that its flowers became inviſible in the evening, by being enfolded in their bracteas, and re-appeared in the morning, which led him to conſider this ſubject, and to write upon it.

We have ſome ſpecimens, belonging to this ſection, which appear to be new ſpecies, or very remarkable varieties, gathered at Algiers by M. Durand.

L. *diffuſus* perhaps ſhould be removed hither; ſee the end of the genus.

Sect. 2. *Flowers many together in a head.*

L. *hirſutus.* Hairy Bird's-foot Trefoil. Linn. Sp. Pl. 1091. Curt. Mag. t. 336.—Heads roundiſh Stem hairy. Legumes ſomewhat ovate.—Native of the ſouth of Europe and the Levant; long known in our gardens, where it requires the ſhelter of a greenhouſe. The *ſtem* is ſhrubby, often four or five feet high, hairy like the *leaves* and *ſtipulas.* *Flowers* white, or bluſh-coloured, prettily contraſted with their red calyx. The *legumes*, though truly cylindrical, are ſo ſhort as to become almoſt ovate. On the ſea beach of the Genoeſe coaſt, this ſpecies grows proſtrate, enlivening the ſtony ground with a profuſion of bloſſoms; ſo that the Linnæan definition, "ſtem erect," is not in all caſes exact.

L. *corniculatus.* Common Bird's-foot Trefoil. Linn. Sp. Pl. 1092. Curt. Lond. faſc. 2. t. 56. Mart. Ruſt. t. 53. Engl. Bot. t. 2090.—Heads depreſſed, of few flowers. Stems decumbent, ſolid. Legumes ſpreading, nearly cylindrical. Claw of the keel obovate. Filaments all dilated.—Native of moſt parts of Europe; very common with us in open graſſy paſtures, where it is conſpicuous in autumn. The *ſtems* ſpread, from the perennial *root*, in every direction, various in length, ſimple or branched, angular, leafy, clothed with cloſe-preſſed hairs. *Flowers* of a golden yellow, more or leſs ſtained or ſtriped with dark red, each head on a long ſtalk, with a ſmall ternate *bractea* at the top. *Legumes* of a ſhining brown, or copper-colour.—This has been recommended for fodder and hay, by the name of Milk-vetch.

L. *major.* Greater Bird's-foot Trefoil.—Scop. Carn. v. 2. 86. Engl. Bot. t. 2091. (L. corniculatus γ et δ; Fl. Brit. 794.)—Heads depreſſed, many-flowered. Stems erect, hollow. Legumes ſpreading, cylindrical. Claw of the keel linear. Shorter filaments not dilated.—Found in wet boggy places, among buſhes and reeds, flowering in ſummer and autumn, probably throughout Europe. Its more erect, hairy habit, and larger ſize, mark this plant ſufficiently to a common obſerver, and the above characters are abundantly ſufficient to diſtinguiſh it from the laſt, with which it has generally been confounded.

L. *diffuſus.* Slender Bird's-foot Trefoil. Fl. Brit. 794. Engl. Bot. t. 925. (L. pentaphyllos minor hirſutus, ſiliquâ anguſtiſſimâ; Bauh. Pin. 332. Trifolium corniculatum minus, piloſum; Bauh. Prodr. 144.)—Flower-ſtalks moſtly ſingle-flowered. Stem much branched, proſtrate. Leaves

and calyx hairy. Legumes round, linear, very ſlender.—Native of Madeira, and of the ſouth coaſt of England. It has an affinity to the two laſt, but is more delicate and ſlender, with ſmaller and paler *flowers*, one or two only together; for which reaſon it ought to be placed in the firſt ſection, though it proves ſuch a diviſion of the genus (by the number of its flowers) to be rather artificial than natural.

The lotus of Africa is rather a thorny ſhrub than a tree; and it abounds in all thoſe parts of Africa through which Mr. Park travelled; but it flouriſhes moſt in a ſandy ſoil. Its fruit is a ſmall farinaceous berry, about the ſize of an olive; which being pounded in a wooden veſſel, and afterward dried in the ſun, is made into excellent cakes, reſembling, in colour and flavour, the ſweeteſt gingerbread. The natives of all deſcriptions eſteem it highly, and ſome of them prepare from it a liquor deliciouſly ſweet; the ſame perhaps which is fabled to have produced ſuch extraordinary effects on the companions of Ulyſſes.

Lotus, in *Gardening*, comprizes plants of the herbaceous and under ſhrubby kind, of which the ſpecies cultivated are, the winged bird's-foot trefoil (L. tetragonolobus); the dark-flowered bird's-foot trefoil (L. jacobeus); the ſilvery bird's-foot trefoil (L. hirſutus); and the ſhrubby bird's-foot trefoil (L. Dorycnium).

Method of Culture.—The firſt ſort is raiſed by ſowing the ſeed annually in the ſpring, in the open ground, in the places where the plants are to remain, in patches in different parts, of five or ſix ſeeds in each, half an inch deep. The plants ſoon come up, which remaining in the ſame place for flowering, require only occaſional weeding, being either ſuffered to trail, according to their natural growth, or tied up to ſticks.

The other ſorts may be increaſed by ſeeds and cuttings. The ſeeds ſhould be ſown in pots of light earth or in a moderate hot-bed; and when the plants are about three inches high be planted out in ſeparate ſmall pots of light rich earth, giving water, and placing them in the ſhade till freſh rooted.

The cuttings of the young ſtalks and branches may be planted any time in the ſpring or ſummer, in beds or pots of rich mould, giving ſhade and water. They emit roots, and form plants in a few weeks, but may be greatly facilitated by covering them cloſe with hand-glaſſes till they begin to ſhoot at top; then they ſhould be gradually inured to the air, and ſoon after be tranſplanted into ſeparate pots.

The firſt of theſe plants is now chiefly cultivated in flower-gardens for ornament, but was formerly grown for the green-pods which were boiled and eaten.

The other kinds effect an agreeable variety in collections of green-houſe plants, both in their foliage and flowers. They all require ſhelter from froſt, the two firſt in particular; the two laſt are ſomewhat hardier, and ſometimes ſucceed in the full ground all the year, in warm dry ſituations. A few plants ſhould however conſtantly be kept in the pots, to be protected in the winter ſeaſon.

Lotus, *Bladder*. a name ſometimes given to a ſpecies of *vulneraria*, or *anthyllis*.

Lotus *Corniculatus*: this is a plant that has a perennial tapering root which ſtrikes deep; there are ſeveral trailing herbaceous ſtems, ſlender, bluntly four-cornered, procumbent except where ſupported, as in meadows or among buſhes, from ſix or ſeven inches to a foot and a half in length; varying even more in different ſoils and ſituations. The leaves are ternate, petioled, one at each joint, the leaflets differing extremely in form, in the ſeveral varieties, from bluntly ovate to linear-lanceolate. The ſtipulas reſemble the leaves, but they are more pointed, and are rather lanceolate than ovate. The flowers grow in flatted heads reſembling umbels, on peduncles from two to three inches and a half in length, but on pedicles hardly a line long. There is a ſingle ſeſſile ternate leaf at the baſe of each head without any ſtipulas; and ſometimes there is only one leaflet or two; the number of flowers varies from three or four to twelve or thirteen.

This ſort of lotus is found in meadows, paſtures, and heaths, flowering in June. It is ſaid to be cultivated in Hertfordſhire as paſturage for ſheep; and it makes extremely good hay; growing in moiſt meadows to a greater height than the trefoils, and ſeems to be of a quality equal, if not ſuperior to moſt of them. In common with ſeveral other leguminous plants, it gives ſubſtance to the hay, and perhaps contributes to render it more palatable and wholeſome for cattle. Dr. Anderſon affirms, that every ſort of domeſtic animal eats it in preference to every other plant: it ſeldom comes to flower in paſture grounds, unleſs where they have been ſaved from cattle for ſome time. What firſt recommended it to his notice was, the having obſerved it to grow and flouriſh in poor ground; as in the midſt of a barren moor, where the ſoil was ſo poor that even heath could hardly grow; upon bare obdurate clays; in dry and barren ſands. It certainly flouriſhes not only in theſe, but alſo chalky ſoils; and on moors, heaths, and downs hard ſtocked with ſheep, the ſurface may be ſeen to be yellow with the flowers of it; which is contrary to what has been aſſerted above, namely, that it ſeldom comes to flower in paſtures. But a greater number of trials are ſtill wanting to fully aſcertain the utility of this plant for field purpoſes, though it certainly promiſes well.

Lotus *Glycycalamus*, a name given by the ancient Greeks to an Egyptian plant according to ſome, and according to others, to a rare plant, found only in few places, and only met with by accident, by the people who made long and uncommon voyages. The whole account given of it, by the earlieſt writers, is no more than that it was of a very ſweet and pleaſant taſte. Myrepſus uſes the term frequently, and his interpreters underſtand him to mean the caſſia fiſtula by it. But we have accounts from Homer, that the followers of Ulyſſes were detained by eating the lotus glycycalamus; and it is not at all probable that the caſſia fiſtula could be the thing meant by the word in this place; neither will the words of the author allow it to be any thing of this kind. The caſſia fiſtula is the fruit of a tree: but this glycycalamus, we find in Homer himſelf, was an herbaceous plant. Quintilian calls it expreſsly a kind of graſs, gramen; and from the other accounts of its growing in form of reeds, and in wet places, it ſeems very probable that it was the ſugar-cane that they called by this name.

Lotus, in *Agriculture*, a ſort of plants of the bird's-foot trefoil kind, of which there are ſeveral ſpecies, ſome of which may be cultivated for the purpoſe of cattle food with advantage.

LOTZEN, in *Geography*, a town, with a caſtle, of Pruſſia, in the province of Natangen, ſeated on a canal which joins the Angerburg and Leventin lakes; 56 miles S.E. of Königſberg. N. lat. 53° 53′. E. long. 21° 57′.

LOVA, a town of Hungary; 20 miles W. of St. Crot.

LOVAGE, in *Botany* and *Gardening*. See Ligusticum.

Lovage, *Baſtard*. See Laserpitium *ſiler*.

LOUAR, in *Geography*, a town of Hindooſtan, in Dowlatabad; 10 miles W.N.W. of Kondur.

LOVAT, a town of European Turkey, in Bulgaria; 64 miles E. of Sofia.

LOVATINI, Giovanni di Ravenna, in *Biography*, a burletta ſinger, with the ſweeteſt tenor voice and ſtyle of ſinging we ever heard on any ſtage. He arrived in England in the autumn of 1766, with Morigi, Savoi, Micheli, La Guadagni, Piatti, and Gibetti.

This excellent troop appeared December 9th, for the firſt time, in our lyric theatre, in the admirable comic opera "La Buona Figliuola," written by Goldoni, and ſet by Piccini. The performance and ſucceſs of this burletta were complete, and rendered the name of Piccini, which had hardly penetrated into this country before, dear to every lover of muſic in the nation. All the performers in this drama eſtabliſhed a character which was of uſe to them during the reſt of their lives.

Lovatini's mellifluous voice, manner of ſinging, and humour; La Guadagni's graceful figure, acting, and ſinging; Morigi's mimickry of the pronunciation, accent, and manner of a German ſoldier; Savoi's fine voice, the characteriſtic manners of the two prating female domeſtics, Piatti and Gibetti, and even the raven-like croak of Micheli, had its ſhare of notice; but whoever remembers the elegant cantabile ſtyle in which Lovatini began the charming duet, "La Baroneſs' Amabile," muſt retain an exalted opinion of his captivating powers in *ſerious* ſinging.

Lovatini, when he quitted this country for his own in 1774, merely retired to die, as news of his death arrived here the next year, and we cannot diſcover that he performed in any other theatre after he left England.

LOVATOVA, in *Geography*, a town on the E. coaſt of the iſland of Flores. S. lat. 8° 30′. E. long. 122° 50′.

LOUBENS, a town of France, in the department of the Upper Garonne; 12 miles N.W. of Revel.

LOUBERE, Simon de la, in *Biography*, was born at Toulouſe in 1642. He ſtudied at the Jeſuits' college, and diſplayed a good poetical taſte by a multitude of light compoſitions, though he was far from neglecting more ſerious purſuits, and particularly attended to politics and public law. He commenced his political career as ſecretary to M. de St. Romain, embaſſador to Switzerland. In 1687, he was appointed by Lewis XV. his envoy extraordinary to the court of Siam, where he remained only about three months, during which he collected a large ſtore of information concerning its natural and civil hiſtory, the religion, manners, &c. of the people. On his return, he publiſhed an account of what he had obſerved, in two vols. 12mo. which became a very popular work. He was afterwards ſent without a public character into Spain, on a ſecret commiſſion, but was arreſted, and obtained his releaſe only in conſequence of repriſals on ſome Spaniards in France. In 1693 he was elected into the French academy, and ſoon afterwards retired to his native city, where he re-eſtabliſhed the "Floral Games," which had ſunk into decay. He died at the very advanced age of eighty-ſeven, in the year 1729. He was a man of very general knowledge, well acquainted with ſeveral languages ancient and modern, and excelled as a writer in various branches of literature. Moreri.

LOUBES, St., in *Geography*, a town of France, in the department of the Gironde; 12 miles N.E. of Bourdeaux.

LOUBIERE, a town of the iſland of Dominica, on the W. coaſt; 17 miles S. of Portſmouth.

LOUBO, a town of Benin, at the mouth of the river Formoſa; 60 miles S.W. of Benin.

LOUBOUEX, St., a town of France, in the department of the Landes; nine miles S.E. of St. Sever.

LOUBRESSAC, a town of France, in the department of the Upper Loire; ſix miles N.W. of Le Puy en Velay.

LOUCHOU, a town of Perſia, in the province of Mazanderan; 45 miles N.E. of Caſbin.

LOUDEAC, a town of France, and principal place of a diſtrict, in the department of the North Coaſts; in which are an iron forge and a manufacture of thread; 20 miles S. of St. Brieuc. The place contains 6096, and the canton 14,611 inhabitants, on a territory of 205 kiliometres, in ſix communes. N. lat. 48° 8′. W. long. 2° 40′.

LOUDES, a town of France, in the department of the Upper Loire, and chief place of a canton, in the diſtrict of Le Puy; ſix miles N.W. of Le Puy. The place contains 800, and the canton 5377 inhabitants, on a territory of 175 kiliometres, in nine communes.

LOUDON, a county of Virginia, in America, on the river Potowmac, adjoining Fairfax, Berkley, and Faquier counties; about 50 miles long and 20 broad, containing 15,533 free inhabitants, and 4990 ſlaves. Its chief town is Leeſburg. Quarries of grey ſtone, white flint, and lime are found in this county. The climate is favourable to apples, pears, peaches, plums, cherries, and grapes. The county was firſt ſettled from Pennſylvania and New Jerſey.—Alſo, a townſhip in Rockingham county, New Hampſhire, taken from Canterbury, and incorporated in 1773; ſituated E. of the Merrimack river, and containing 1279 inhabitants.—Alſo, a townſhip in Berkſhire county, Maſſachuſetts; 21 miles S.E. of Lenox; incorporated in 1773, and containing 614 inhabitants, and 13,000 acres, of which 2944 are ponds.

LOUDUN, a town of France, and principal place of a diſtrict, in the department of the Vienne, ſituated on an eminence between the Creuſe and the Dive; 12 miles E. of Thouars. The place contains 5138, and the canton 11,299 inhabitants, on a territory of 245 kiliometres, in 18 communes. N. lat. 47°. E. long. 0° 10′.

LOVE, in *Ethics*, is one of the primitive paſſions; and may be generally defined to be the gravitation or tendency of the ſoul toward good. According to Dr. Hartley, who traces all our paſſions to the ſources of pleaſure and pain, they may be firſt and generally diſtributed into the two claſſes of love and hatred; *i. e.* we may have all thoſe affections of the pleaſurable kind, which objects and incidents raiſe in us, love, and all thoſe of the painful kind, hatred. Thus we are ſaid to love not only intelligent agents of morally good diſpoſitions, but alſo perſonal pleaſures, riches, and honours, and to hate poverty, diſgrace, pain, bodily and mental. When our love and hatred are excited to a certain degree, they put us upon a variety of actions; and may be termed deſire and averſion, by the latter of which Dr. Hartley underſtands active hatred.

If the affection of love be conceived ſeparate from any alteration in the body, it is called intellectual or rational love; if it be attended with an agitation of blood and ſpirits, it is called ſenſitive or paſſionate love. It is obſerved by moral writers, that thoſe paſſions in which love predominates, are more agreeable to the original intention of nature than thoſe which are ranged under hatred; becauſe they are found to have a more friendly influence upon the body, and tend, within proper bounds, to the preſervation and happineſs of life, which the others do not. See Cumberland de Leg. Nat. c. 2. § 19.

Love, regarding its object as abſent, begets deſire; as preſent, either immediately or in proſpect, joy and hope. Love of deſire, abſtractedly conſidered, is a ſimple tendency towards good; when conſidered as wiſhing the good deſired to ſome being or other, it is called *benevolence* and *ſelf-love*. See Pleasure and Pain, and Passion.

Love inſpires muſic and poetry. This was a memorable maxim among the Greeks, and the ſubject of one of Plutarch's ſympoſiacs. See Scolta and Song.

Love, in its uſual and more appropriate ſignification, denotes that affection, which, being compounded of intellectual and ſenſitive love, or of animal deſire, eſteem, and benevolence, becomes the bond of attachment and union between individuals of the different ſexes; and makes them feel in the ſociety of each other a kind of happineſs which they experience no where elſe.

Love, *Family of.* See Family.

Love, *Platonic.* See Platonic.

Love *Apple*, is the Engliſh name for the fruit of the lycoperſicon, a plant cultivated in gardens with us, for the ſingularity of its appearance. The Portugueſe call it tomato, and eat the fruit, either raw or ſtewed: as do the Jew families in England. See Solanum *Lycoperſicum.*

Love-*Graſs.* See Grass.

Love *in a Miſt.* See Passion *Flower.*

Love *lies Bleeding.* See Amaranthus.

Love, *Tree of.* See Cercis.

LOUÉ, in *Geography*, a town of France, in the department of the Sarthe, and chief place of a canton, in the diſtrict of Le Mans; 15 miles W. of Le Mans. The place contains 1204, and the canton 12,563 inhabitants, on a territory of 245 kiliometres, in 16 communes.

LOVELL, a town of America, in York county, Maine, N. of Great Oſſipee, 89 miles N. of York.

LOVENTINUM, or Luentinum, in *Ancient Geography*, a town of the Demetæ, in Britain, ſuppoſed by ſome, without ſufficient reaſon, to have been ſwallowed up by an earthquake in the ſcite of the preſent Llyn Savanathan, near Brecknock, but by others, with great probability, to have been ſituated at or near Llan-Dewi-Brevi, in Cardiganſhire; where, in a field called Caer Ceſtlib, or Caſtle-field, Roman coins and bricks are ſometimes found.

LOVERANO, in *Geography*, a town of Naples, in the province of Otranto; five miles N.N.E. of Nardo.

LOVESKAIA, a town of Ruſſia, on the Caſpian ſea; 27 miles S E. of Aſtrachan.

LOUGH, or Lake, *Arrow.* See Arrow:—L. *Barra.* See Barra:—L. *Beg.* See Beg:—L. *Carra.* See Carra:—L. *Clean.* See Clean:—L. *Conn.* See Conn:—L. *Corrib.* See Corrib:—L. *Coutra.* See Coutra:—L. *Curran.* See Curran:—L. *Derg.* See Derg:—L. *Derveragh.* See Derveragh:—L. *Ennel.* See Ennel:—L. *Erne.* See Erne:—L. *Foyle.* See Foyle:—L. *Gara.* See Gara:—L. *Gawnah.* See Gawnah:—L. *Gilly.* See Gilly:—L. *Glin.* See Glin:—L. *Gur.* See Gur:—L. *Hoyle.* See Hoyle:—L. *Hyne.* See Hyne:—L. *Iron.* See Iron:—L. *Killarney.* See Killarney:—L. *Larne.* See Larne:—L. *Lena.* See Lena:—L. *Malar.* See Malar:—L. *Maſk.* See Mask:—L. *Melvin.* See Melvin:—L. *Naſtay.* See Naftay:—L. *Nallenroe.* See Nallenroe:—L. *Neagh.* See Neagh:—L. *Ogram.* See Ogram:—L. *Oughter.* See Oughter:—L. *Pallis.* See Pallis:—L. *Ramar.* See Ramar:—L. *Rabhan.* See Raphan:—L. *Rea.* See Rea:—L. *Rec.* See Rec:—L. *Saleen.* See Saleen:—L. *Sheban.* See Sheban:—L. *Strangford.* See Strangford:—L. *Swilly.* See Swilly:—L. *Ta.* See Ta:—L. *Triorty.* See Triorty:—L. *Tra.* See Tra.

LOUGHABER, or Lochaber, a ſmall ſettlement in Georgia, on a branch of Savannah river, above its confluence with the Tugalo.

LOUGHBOROUGH, a market town and pariſh in the hundred of Weſt Goſcote, and county of Leiceſter, England, is ſituated 12 miles diſtant from the county town, and 108 miles from London, on the banks of the river Soar, over which it has a good ſtone bridge. According to its ſize and population, it may be eſteemed the ſecond town in the county. Leland ſays, "The town of Lughborow is yn largeneſs and good building next to Leyrceſter, of all the markette tounes yn the ſhire, and hath in it a four faire ſtrates or mo, well pavid. The paroch chirche is faire. Chapelles or chirches beſides, yn the towne, be none. The hole toune is builded of tymbre. At the ſoutheſt end of the chirch is a faire houſe of tymbre, wher ons king Henry VII. did lye." Loughborough conſiſts of one pariſh, to which belong the two hamlets of Wood-thorpe and Knight-thorne, both about a mile diſtant; each having its proper officers, and maintaining its own poor. Great part of the town is the property of the earl of Moira, to whom it came from his uncle the late earl of Huntingdon, in whoſe family it has been ſince the time of queen Mary. The church is a large pile of building, conſiſting of a nave, ſide aſles, chancel, tranſept, and tower; the latter was built by ſubſcription, towards the end of the ſixteenth century. In the church-yard is a free grammar ſchool, which was endowed with the rents of certain lands, &c. left by Thomas Burton for the maintenance of a chantry within the church. Here is alſo a charity ſchool for eighty boys and twenty girls. Four meeting-houſes are appropriated to the Preſbyterians, Baptiſts, Quakers, and Weſleyan Methodiſts. On the ſcite of an old croſs, a modern market-houſe, or what is called the butter and hen croſs, was erected in 1742; it is ſupported by eight round brick pillars. At the upper end of the market place ſtands a ruinous brick edifice, called the court chamber, where the lord of the manor's court leet is annually held. The building appears to have been erected in 1688; it is ſometimes uſed as a theatre and ball-room. The town ſuffered ſeverely by the plague at various periods in the ſixteenth and ſeventeenth centuries. Under the act of 1800, the population was returned as 4546, inhabiting 981 houſes. The chief manufactures carried on here are hoſiery, wool-combing, and frame work knitting.

Six annual fairs are held, and a weekly market on Thurſdays. In the year 1770, the town contained 43 licenſed inns and alehouſes; in 1783, the number exceeded 50.

The Loughborough canal, which communicates with that called the Union canal, and with the river Soar, has proved very ſerviceable to this town, and an advantageous concern to the original proprietors; as 95*l.* a-year dividend has been paid on a ſhare of 125*l.*; and one of theſe ſhares has been ſold for 1800*l.* Nichols's Hiſtory of Leiceſterſhire.

Loughborough, a townſhip of Upper Canada, in Frontenac county, N. of Kingſton.

Loughborough *Canal*, an inlet on the W. coaſt of North America, in the gulf of Georgia, about 30 miles long, and one broad, between mountains nearly perpendicular. The entrance is in N. lat. 30° 27′. E. long. 234° 35′.

LOUGHBRICKLAND, a poſt-town of Ireland, in the county of Down, on the road to Belfaſt. It is 58 miles north from Dublin, and 22 from Belfaſt.

LOUGHGALL, a ſmall poſt-town of Ireland, in the county of Armagh; it is 66 miles N. from Dublin, and three miles N.N.W. from Richhill.

LOUGHREA, a poſt-town of Ireland, in the county of Galway. It is ſituated on a fine lake of the ſame name, and is 87 miles W. by S. from Dublin.

LOUHANS, a town of France, and principal place of a diſtrict, in the department of the Saone and Loire, ſituated at the conflux of the Seille and Solnan. The

French and Swiſs merchants have been accuſtomed to meet here for the purpoſes of commerce. The place contains 2849, and the canton 12,221 inhabitants, on a territory of 140 kiliometres, in 10 communes; 15 miles S.E. of Chalons ſur Saone. N. lat 46° 38′. E. long. 5° 18′.

LOUICHEA Cervina, in *Botany*, ſo named by l'Heritier, in honour of his countryman M. René Louiche Desfontaines, M.D. Profeſſor of Botany at Paris, in a monograph of which 12 copies only were printed; ſee Heritier. The plant was afterwards diſcovered to be *Pteranthus* of Forſkall; ſo that it appeared in l'Heritier's *Stirpes Novæ*, t. 65, under the appellation of *Louichea Pteranthus*. It is indeed the *Camphoroſma Pteranthus* of Linnæus, *Mant* 41; ſee Camphorosma. If any future botaniſt ſhould determine this plant to be a diſtinct genus, it muſt retain the name of *Pteranthus*; not only for the ſake of its aptitude and priority, but becauſe another genus is now conſecrated to the honour of M. Desfontaines. See Fontanesia.

LOVIGNANO, in *Geography*, a town of Naples, in the province of Otranto; 12 miles S.S.W. of Brindiſi.

LOUIS XII. of France, in *Biography*. See Josquin du Prés.

Louis XIII. This prince (ſee Lewis), who began his reign in 1610, at only ſix years old, is ſaid to have been not only a lover and encourager of the art of muſic in riper years, but to have compoſed ſeveral airs with the aſſiſtance of Beauchamp, his firſt violin, who made the baſe. Recueil d'aire de cour.

Père Merſenne, Kircher, and later muſical writers, have given, as a ſpecimen of his invention, an air for a grand dance, in 1618, before he was fifteen years old. *Les vingt quatre violons du roi* ſubſiſted in the time of Henry IV.; but theſe ſeem only to have been employed for dancing. The lute was more an inſtrument of parade in theſe times than any other; and in 1609, Mary de Medicis, Henry IVth's ſecond queen, was followed in a grand dance by twelve lutes, led by Ballard, the principal luteniſt of the court: and all the numerous collections of the court airs at this time were printed in the lute tablature, or notation, to which they were ſet by the authors of the tunes themſelves. The moſt minute and ſatisfactory account of the ſtate of muſic in France, during the reign of Louis XIII. is to be found in the writings of Père Merſenne, particularly in his "Harmonie Univerſelle," publiſhed at Paris in 1636, in folio, a work which he afterwards compreſſed, and tranſlated into Latin, and publiſhed in 1648, the year of his death, under the title "De Sonorum Natura, Cauſis et Effectibus." A work in which, through all the partiality to his country, want of taſte and method, there are ſuch innumerable curious reſearches, and ingenious and philoſophical experiments, of which ſubſequent writers on muſic have availed themſelves, particularly Kircher, as render the book extremely valuable. In his twenty-third propoſition, liv. i. this author explains and deſcribes twelve different kinds of muſic and movement uſed in France during his time: theſe were motets, ſongs or airs, paſſacailles, pavans, allemandes, gaillards, voltes, courantes, ſarabandes, canaries, branles, and balets, of all which he gives examples in notes. But though moſt of theſe movements were the ſpecific names of the dances then in vogue, the minuet, which, during the laſt century, was in ſuch general uſe and favour all over Europe, is never mentioned.

Louis XIV. This magnificent prince (ſee Lewis), whoſe ambition was not confined to extenſion of empire, ſeems to have patroniſed muſic, and to have eſtabliſhed an opera in his capital, more as a ſplendd ſpectacle, which no other ſovereign could afford to ſupport, than from the pleaſure which he received from modulated ſound. He was, however, during his minority, taught the guitar by an Italian, whom cardinal Mazarin ſent for expreſsly from Italy; but as the actions and faculties of this young monarch were to be regarded as wonderful, he is ſaid by his flatterers, in eighteen months to have excelled his maſter (Hiſt. de la Muſ.), and to have underſtood muſic in perfection. Indeed, the firſt dramatic muſic which he heard was Italian; as cardinal Mazarin, during the minority of this prince, had two operas in Italian verſe, and ſet to Italian muſic, performed by a company of Italian ſingers ſent from Italy, to impreſs the court of France with a favourable idea of the faſhionable muſic of his country. The firſt of theſe operas, performed at the Bourbon palace in 1645, ſeems to have been a burletta. Its title was "La Feſta Teatrale della Finta Pazza," written by Giulio Strozzi, but by whom ſet does not appear. The ſecond was "Orfeo et Euridice," 1647. Beſides theſe, at the nuptials of Louis XIV. 1660, "Ercole Amante," a ſerious Italian opera, was performed in the ſame manner, and well received at court by the flatterers of the cardinal, ſays the continuator of Bonnet's Hiſtory of Muſic. M. de Blainville, however, in his ſhort Hiſtory of Muſic, ſays, that he had ſeen the ſcore of this opera, "and found, in examining it, all the recitatives, airs, choruſes, ſymphonies, and dances, both in melody and harmony, of the ſame kind as thoſe of Lulli." And at the time that Lulli came into into France, 1646, the opera in Italy had made but a ſmall progreſs towards that perfection at which it afterwards arrived. It then conſiſted chiefly of recitative with frequent cloſes, *ad libitum*, and choruſes, but no airs or meaſured melody for a ſingle voice. And in this ſtate the opera continued in France till the death of Rameau, and arrival of Gluck and Piccini at Paris; while in all the capitals of Italy and Germany, melody was poliſhed, taſte refined, modulation extended, and harmony enriched by new combinations. Whatever horror and hatred the ambition of Louis might have excited in his neighbours, and envy by his magnificence, his moſt bitter and irreconcileable enemies muſt have allowed that muſic was the only one of all the arts and ſciences which was not ſucceſsfully cultivated in France, during the proſperous part of his long and ſplendid reign. Indeed the failure of muſic was not ſo much owing to want of genius and love of the art in the natives, as to the naſal tones and natural cantilena of their language; nor would the reſt of Europe have ſo diſliked, cenſured, and contemned their muſic, if they had not at all times inſiſted on its being the beſt in the univerſe, and the model which all other nations ought implicitly to follow.

Louis, Anthony, an eminent French ſurgeon, was born at Metz on the 13th of February 1723. He attained to great reputation in his profeſſion, and was honoured with numerous appointments and offices, the juſt rewards of his merit. He was ſecretary of the Royal Academy of Surgery at Paris, conſulting ſurgeon to the king's forces, ſurgeon-major to the hoſpital La Charité, doctor in ſurgery of the faculty of Halle, in Saxony, honorary member of the Royal College of Phyſicians of Nancy, and member of many of the learned ſocieties, not only in France, but in foreign countries. The time of his death is not known, but the lateſt of his publications is dated in 1777. In addition to the ſurgical part of the "Encyclopédie," which M. Louis wrote, and to ſeveral intereſting papers preſented to the Academy of Surgery, he was author of a great number of works on medical, chirurgical, and anatomical ſubjects, the principal of which we ſhall mention. "Obſervations ſur l'Electricité," &c. Paris, 1741, 12mo: "Eſſai ſur la Nature de l'Ame, où l'on tache d'expliquer ſon union avec le corps," ibid. 1746, 12mo.: "Cours de Chirurgie pratique ſur les plaies d'armes à feu," ibid. 1746, 4to.: "Obſervations et Remarques ſur les effets du virus cancereux," &c. ibid. 1748: "Poſitiones Anatomico-chirurgicæ de capite ejuſque vulneribus," ibid. 1749: "Lettre ſur la certitude des ſignes de la mort, avec des obſervations et des experiences ſur les noyés," ibid. 1749, 12mo. He attributed the death of perſons drowned to the entrance of water into the lungs, which farther experience has diſproved. "Experiences ſur la Lithotomie," 1757, in which he expreſſed his diſapprobation of the biſtouri caché of Frere Côme. "Memoire ſur une queſtion anatomique, relatif à la juriſprudence," &c. 1763. This memoir, written after the ſhocking affair of Calas, was intended to eſtabliſh the diſtinction of the appearances after voluntary death by hanging, and after murder by that mode. "Memoire ſur la légitimité des naiſſances prétendues tardives," 1764, in 8vo; in which the author maintains that the retardation of parturition beyond the natural period of geſtation, *i. e.* more than ten days beyond the ninth month, is phyſically impoſſible. He publiſhed a ſupplement to this treatiſe in the ſame year. "Recueil d'Obſervationes d'Anatomie et de Chirurgie, pour ſervir de baſe à la Theorie des leſions de la tête par contrecoup," 1766: "Hiſtoire de l'Academie Royale de Chirurgie depuis ſon etabliſſement juſqu'en 1743," printed in the fourth volume of the memoirs. His laſt publication was a tranſlation of M. Aſtruc's work "De Morbis Venereis," into French. In addition to theſe works, M. Louis alſo tranſlated Boerhaave's Aphoriſms of Surgery, with Van Swieten's Commentary; and wrote ſeveral eulogies on deceaſed members of the Academy of Surgery, and various controverſial tracts, eſpecially concerning the diſputes between the phyſicians and ſurgeons of Paris in 1748, &c. Eloy Dict. Hiſt. Gen. Biog.

LOUIS, *Lewis, Louis d'or*, or *Lewidore*, a French coin, firſt ſtruck in 1641, under the reign of Louis XIII. and which has ſince had a conſiderable currency.

Louis d'ors, at firſt, were valued at ten livres, afterwards at eleven, and at length at twelve and fourteen. In the latter end of the reign of Louis XIV. they were riſen to twenty, and in the beginning of that of Louis XV. to thirty and thirty-ſix, nay forty and upwards; with this difference, however, that in the laſt coinings the weight was augmented in ſome proportion to the price, which in the former reign was never regarded. The Louis d'ors coined before 1726, which then paſſed for 20 livres, were coined at the rate of $36\frac{1}{4}$ *per* French mark of gold, 22 carats fine: the remedy in the weight was 14 grains *per* mark, and the remedy in the alloy one-fourth of a carat. Theſe ceaſed to be a legal coin in France as far back as 1726; but they ſtill continued to circulate through many parts of Germany and Switzerland, where they had a fixed value, and were known by the name of "Old Louis d'ors:" of theſe few are now in circulation. From the year 1726 to 1785, Louis d'ors were coined at the rate of 30 to the mark of gold, 22 carats fine, with a remedy of 15 grains in the weight, and $\frac{1}{12}$ of a carat in the alloy. Accordingly before 1786, the double Louis weighed 10 dwt. 11 gr. contained in pure gold 224.9 gr. and was valued at 1*l.* 19*s.* $9\frac{1}{2}$*d.* ſterling: the Louis weighed 5 dwt. $5\frac{1}{2}$ gr. contained in pure gold 112.4 gr. and was valued at 19*s.* $10\frac{3}{4}$*d.* ſterling: and the demi-louis weighed 2 dwt. $14\frac{3}{4}$ gr. contained in pure gold 56.2 gr. and was valued at 9*s.* $11\frac{1}{2}$*d.* ſterling. Theſe coins ceaſed to be current in France in 1786. In Holland, Germany, &c. they were called "New Louis d'ors," by way of diſtinction from thoſe which we have before mentioned; though theſe are now become the old ones. The intrinſic value of ſuch a Louis d'or (making the full allowance for remedy) is very little more than a pound ſterling. In 1785 and 1786, all the gold coins in France were called in and ordered to be melted down; and a new coinage took place, at the rate of 32 Louis d'ors to the mark of the ſame degree of fineneſs, with the ſame allowances for remedy as above. Accordingly, the double Louis coined ſince 1786, weighed 9 dwt. 20 gr. contained 212.6 gr. of pure gold, and was valued at 1*l.* 17*s.* 8*d.* ſterling: the Louis weighed 4 dwt. 22 gr. contained of pure gold 106.3 gr. and was valued at 18*s.* 10*d.* ſterling. The intrinſic value of this new Louis d'or (allowance being made for remedy) is 18*s.* $9\frac{1}{4}$*d.* ſterling; and 1*l.* ſterling = 25 livres, 10 ſous Tournois, in gold. Louis d'ors may be conſidered as a current coin in moſt parts of the continent; but in England they are ſold merly as merchandize, and their price has fluctuated from 18*s.* 6*d.* to 21*s.* ſterling.

On one ſide of the coin is the king's head, with his name and title, thus: LUD. XVI. D.G. FR. ET NAV. REX. *i. e.* Louis XVI. king of France and Navarre; on the reverſe, the arms of France and Navarre, with a crown over them. On the pieces coined before 1786, there are two diſtinct ſhields; and on thoſe coined ſince 1786, a double ſhield: the legend is, CHR. REGN. VINC. IMPER. *i. e.* Chriſt reigns, conquers, governs: under the arms is a letter, by which the mint where the piece was coined is diſtinguiſhed. The double and half Louis bear the ſame impreſſion.

There are alſo white Louiſes, or Louis d'argent, ſome of 120, others of 60 ſols a piece, called alſo ecus; and among us French crowns, half-crowns, &c. The old ecus, coined before 1726, were coined at the rate of 9 pieces to the mark of 10 deniers 22 grains fine: theſe, like the Louis d'ors of the ſame period, after they had ceaſed to be current in France, ſtill preſerved a fixed value in ſome parts of Germany; but they are now ſcarcely in circulation. In 1726, the coinage of ecus was regulated, and continued without alteration, as follows: $8\frac{3}{16}$ ecus of 6 livres, or $16\frac{3}{8}$ ecus of 3 livres, were to be coined from a mark of ſilver 11 deniers fine, with a remedy of 36 grains per mark in the weight, and $\frac{1}{8}$ of a denier in the alloy: and their intrinſic value is (allowance being made for remedy) 4*s.* $9\frac{1}{4}$*d.* ſterling; or, 1*l.* ſterling = 25 livres, 3 ſous Tournois, in ſilver.

On the one ſide of theſe is the king's head, and on the other the French arms, with this legend, "Sit nomen Domini benedictum."

The Louis d'or is a gold coin of Malta. The double, ſingle, and half Louis d'ors are coined by the grand maſter Rohan, at 20, 10, and 5 ſcudi, copper or current money. The double Louis weighs 10 dwt. 16 gr., contains of pure gold 215.3 gr., and is valued at 1*l.* 18*s.* $1\frac{1}{4}$*d.* ſterling. The Louis weighs 5 dwt. 8 gr., contains of pure gold 108 gr., and is valued at 19*s.* $1\frac{1}{4}$*d.* ſterling. The demi-louis weighs 2 dwt. 16 gr., contains of pure gold 54.5 gr., and is valued at 9*s.* $7\frac{3}{4}$*d* ſterling. The fineneſs of the gold coins of Malta undergoes great variation. Kelly's Univerſal Cambiſt.

LOUIS, *Knights of St.*, is the name of a royal and military order, inſtituted by Louis XIV., in addition to that of "Chriſtian charity," which had been founded by Henry III. king of France, in 1693, in favour of the maimed officers and ſoldiers of his army, who had ſignalized themſelves in the ſervice. This order conſiſted of eight great croſſes, and twenty-four commanders, beſides the king, who was grand maſter, the dauphin always inveſted with it, and the treaſurer, recorder, and uſher. The badge of the order was "a croſs of eight points enamelled white, edged with gold; it in the angles four fleurs-de-lis; and in the middle a circle, within which on one ſide the image of St. Louis in armour, with the royal mantle over it, holding in his right hand a crown of laurel, and in his left hand a crown of thorns, and the three paſſion-nails, all proper;" with this inſcription, LUDOVICUS MAGNUS INSTITUIT 1693: on the reverſe, "a ſword erect, the point through a chaplet of laurel," bound with a white ribbon enamelled, with this motto, BELLICÆ VIRTUTIS PRÆMIUM. The great croſſes had the croſs pendent to a broad bright red ribbon, which they wore paſſing ſcarfwiſe over the left ſhoulder and under the right arm: they alſo wore the like croſs embroidered with gold on the outſide of their upper garment. The commanders wore the croſs pendent to a broad ribbon, in the ſame manner as worn by the great croſſes; but they have it not embroidered on their clothes. The knights wore a ſmall gold croſs pendent at a red ribbon, faſtened at a button-hole of their coats.

At the time of their inſtitution, the king charged his revenue with a fund of three hundred thouſand livres, for the penſions of the commanders and knights.

LOUIS, *St.*, in *Geography*, an iſland on the weſt coaſt of Africa, at the mouth of the river Senegal; flat, ſandy, and barren. Its name is derived from a fort built by the French. Both were ceded to the Engliſh by the treaty of Verſailles, in 1763. During the American war it was taken by the French, and kept by them after the peace of 1783. N. lat. 16°. W. long. 16° 8′.—Alſo, a ſea-port town on the ſouth coaſt of the iſland of Hiſpaniola. It is ſituated at the head of a bay of its name. N. lat. 18° 16′. W. long. 74° 19′.—Alſo, a ſea-port town of Hiſpaniola, on the north coaſt; ruined in 1797 by a hurricane; 5 miles S.E. of Cape François.—Alſo, a town of South America, in the province of Guiana. N. lat. 3° 55′. W. long. 52° 30′.—Alſo, the capital town of Guadaloupe, Grand Terre, with a fortreſs; 3 leagues S.E. of the Salt river.—Alſo, a town on the weſt ſide of the river Miſſiſippi, 25 miles below the mouth of the Miſſouri. It is ſituated on a pleaſant and healthy eminence, and contained, in 1799, 130 large commodious houſes, built of ſtone, and 925 inhabitants, of whom 268 are ſlaves.. In this year the productions of the ſettlement were 4300 buſhels of wheat, 10,300 buſhels of corn, and 1650 pounds of tobacco. The inhabitants poſſeſſed 1140 horned cattle, and 215 horſes.—Alſo, a ſmall, compact, beautiful bay in Weſt Florida, with about ſeven feet water: the land near it is of a light ſoil, and good for paſture. Formerly here were ſeveral ſettlers; but in the year 1767 the Choctaw Indians killed their cattle, and obliged them to remove.—Alſo, a lake of Canada, commencing, or rather terminating at La Chine, a village which ſtands at the lower end of it. The lake is about 12 miles in length, and four in breadth. At its uppermoſt extremity it receives a large branch of the Utawas river, and alſo the ſouth-weſt branch of the river St. Lawrence, which by ſome geographers is called the river Cadaraqui, and by others the river Iroquois; but in the country, generally ſpeaking, the whole of that river, running from lake Ontario to the gulf of St. Lawrence, goes ſimply under the name of St. Lawrence. At the upper end of lake St. Louis, the water is very ſhallow, owing to the banks of mud and ſand waſhed up by the two rivers; and theſe banks are entirely covered with reeds, ſo that when a veſſel ſails over them, ſhe appears at a little diſtance to be abſolutely ſailing over dry land. This part of the lake is infeſted with clouds of inſects, ſimilar to thoſe which have been commonly obſerved on various parts of the river St. Lawrence. Their ſize is about that of a gnat; their colour is white; and their form ſo delicate, that the ſlighteſt touch deſtroyed them, and reduced them to powder. Their wings are broad in proportion to their ſize, and fly heavily; ſo that it is only when the air is remarkably calm, that they can venture to make their appearance. N. lat. 45° 25′. W. long. 73° 20′. Weld's Travels through Canada, vol. ii.—Alſo, a group of ſmall iſlands in the river St. Lawrence. N. lat. 45° 23′. W. long. 73° 30′.—Alſo, a river of America, which runs into lake Superior. N. lat. 46° 44′. W. long 91° 52′.

LOUIS *de Maranham, St.*, a town on the north coaſt of Braſil, and on the Atlantic ocean, ſituated on the eaſt ſide of Mearim river; about half way between point Mocoripe and the mouth of the river Para.

LOUISA, or DEGERBY, a ſea-port town of Sweden, in the province of Nyland, on the north coaſt of the gulf of Finland, built in 1745 as a frontier town towards Ruſſia, and at firſt called Degerby, but afterwards Louiſa, in 1752, by king Adolphus Frederic. It is an open town, defended towards the ſea by a ſmall fortreſs. The houſes are all of wood, and of two ſtories, painted with a red colour, and appearing much neater than the common towns in Ruſſia. N. lat. 60° 27′. E. long 26° 16′.

LOUISA, a county of Virginia, adjoining Orange, Albemarle, Fluvanna, Spottſylvania, and Goochland counties. It is about 35 miles long, and 20 broad, and contains 5900 free inhabitants, and 5992 ſlaves. Many parts of this county are covered with pine.—Alſo, a river of Virginia, the head-water of Cole river, a ſouth-weſt branch of the Great Kanhaway.—Alſo, a river of Africa, which runs into the Atlantic, S. lat. 5° 10′.

LOUISA *Chitto*, or *Looſa Chitto*, a river of America, which riſes on the borders of South Carolina, and runs a ſouth-weſterly courſe, through the Georgia Weſtern lands, and joins the Miſſiſippi juſt below the Walnut hills, and 10 miles from Stony river. It is 30 yards wide at its mouth, and ſaid to be navigable for canoes 30 or 40 leagues.

LOUISBOURG, the capital of Sydney, or Cape Breton, iſland, in North America; ſituated on a point of land, on the ſouth-eaſt ſide of the iſland. Its ſtreets are regular and broad, conſiſting chiefly of ſtone houſes, with a large parade, at a little diſtance from the citadel, the inſide of which is a fine ſquare, nearly 200 feet on each ſide. On its north ſide, while the French had poſſeſſion of it, ſtood the governor's houſe and the church; the other ſides were occupied by barracks, bomb-proof, in which the French ſecured their women and children during the ſiege. The town is nearly half a mile long, and two in circuit. Its harbour is one of the fineſt in that country, being almoſt four leagues in circuit, with ſix or ſeven fathoms of water in every part of it. The anchorage is good, and ſhips may run aground without danger. Its entrance is not above 300 toiſes in breadth, formed by two ſmall iſlands, and is known, 12 leagues out at ſea, by cape Lorembec, ſituated near the north-eaſt ſide of it. The interior of the harbour is more than half a mile broad from N.W. to S.E. in the narroweſt part, and ſix miles long from N.E. to S.W. In the north-eaſt part is a fine careening wharf, ſecure from all winds. On the oppoſite ſide are the fiſhing ſtages, and room for 2000 boats to cure their fiſh. The cod-fiſhery may be continued from April to the cloſe of November. In winter the harbour is entirely frozen, ſo that it may be walked over; and it continues in this ſtate from the end of November till May or June. The principal trade of Louiſbourg is the cod-fiſhery, from which the inhabitants derive great profits; fiſh being plentiful, and deemed better than any about Newfoundland. This place was taken from the French in 1745, and reſtored to France by the treaty of Aix-la-Chapelle in 1748. It was again captured by the Engliſh in 1758, and its fortifications have been ſince demoliſhed. N. lat. 45° 55′. W. long. 59° 50′.

LOUISBOURGH, in Pennſylvania. See HARRISBURGH.

LOUISBURG, a poſt-town of America, in Franklin county, North Carolina; 265 miles from Waſhington.

LOUISIADE, the ſouthern coaſt of a conſiderable iſland belonging to New Guinea, ſo called by M. Bougainville in 1768.

LOUISIANA, a country of North America, firſt diſcovered by Ferdinand de Soto in 1541, and afterwards viſited by colonel Wood in 1654, and by captain Bolt in 1670. But the firſt perſon who attempted to ſettle in this country was M. de la Salle, who, in 1682, traverſed the Miſſiſippi; and in the following year he repaired to France, and, in conſequence of the repreſentations which he made of his diſcoveries, obtained a grant of four ſmall veſſels and 170 men, with which armament he ſet ſail for the mouth of the Miſſiſippi. In 1685 this ſmall colony, under the direction of their leader, landed in the bay of St. Bernard's, about 300 miles weſt of the place of their deſtination. After ſtruggling with many hardſhips, both in their landing and in their endeavours to ſettle, ſome of this colony murdered La Salle, and all the reſt periſhed, except ſeven perſons, who penetrated through the country to Canada. In 1699, M. Ibberville of Canada, a brave naval officer, having obtained the patronage of the French court, ſailed from Rochfort with two ſhips and a number of men, and laid the foundation of the firſt French colony on the Miſſiſippi. This colony was diminiſhed, by ſome unfavourable circumſtances in 1712, to 28 families. At this time Crozat, a merchant of great opulence and an adventuring ſpirit, obtained the excluſive trade of Louiſiana; but his plans, which were extenſive and patriotic, proving ineffectual, he reſigned his charter, in 1717, to a company formed by the famous projector John Law. From this period the country became an object of intereſt to ſpeculative adventurers, ſo that in 1718 and 1719 a numerous colony of labourers, collected from France, Germany, and Switzerland, was conveyed to Louiſiana, and ſettled in a diſtrict called "Biloxi," on the iſland of Orleans, a barren and unhealthy ſituation, where many hundreds died through want and vexation. This event ruined the reputation of the country; and the colony having languiſhed till the year 1731, the company at length, for the ſum of 1,450,000 livres, purchaſed the favour of ſurrendering their concerns into the hands of the government. The French continued in quiet poſſeſſion of Louiſiana, frequent conteſts with the Indians excepted, till the year 1762. Among theſe tribes of hoſtile Indians we may reckon the Natchez, who appear in the year 1731 to have been almoſt wholly extirpated. In 1736 and 1740 the coloniſts were engaged in bloody wars with the Chickaſaw Indians; but theſe, in proceſs of time, terminated in permanent peace. From this time the proſpects of the coloniſts were brightening, as their peltry trade with the Indians and their commerce with the Weſt Indies were increaſing. Several hundred Canadians and recruits of inhabitants from other countries ſettled on the banks of the Miſſiſippi, and imparted additional ſtrength and proſperity to the original colony.

Such was the ſtate of the country, when in the year 1764 the inhabitants received information that in November 1762, Louiſiana, comprehending New Orleans and the whole territory W. of the Miſſiſippi, had been ceded to Spain by a ſecret treaty. This meaſure incenſed the coloniſts, and was vigorouſly oppoſed, ſo that complete poſſeſſion of the country was not obtained by Spain till the 17th of Auguſt 1769, after which event ſeveral victims were ſacrificed, to atone for the delay of ſubmiſſion, and others were conveyed away to languiſh out their lives in the dungeons of the Havannah. By the treaty of peace in 1763, which ceded Canada to Great Britain, the boundaries of the Britiſh provinces were extended ſouthward to the gulf of Mexico, and weſtward to the Miſſiſippi, and Louiſiana was limited N. by Canada, and E. by the Miſſiſippi, excepting that it included the iſland of New Orleans on its E. bank. This ſtate of things remained till the American revolutionary war, during which Spain took from Great Britain the two Floridas: the United States, according to their preſent limits, became an independent government, and left to Great Britain, of all her American provinces, thoſe only which lie N. and E. of the United States. All theſe changes were ſanctioned and confirmed by the treaty of 1783. Thus things continued till the treaty of St. Idelfonſo, October 1, 1800, by which Spain engaged to cede to the French republic, on certain conditions, the colony or province of Louiſiana, with the ſame extent which it actually had when France poſſeſſed it. This treaty was confirmed and enforced by the treaty of Madrid, March 21, 1801. From France it paſſed to the United States by the treaty of the 30th of April 1803. In conſideration of this ceſſion, the government of the United States engaged to pay to the French government, under certain ſtipulations, the ſum of 60,000,000 francs, independent of the ſum which ſhould be fixed by another convention for the payment of the debts due by France to the citizens of the United States. The boundaries of Louiſiana, as formerly poſſeſſed by France and Spain, and now held by the United States, are ſtated as follows; *viz.* S. on the gulf of Mexico, from the bay of St. Bernard, S.W. of the Miſſiſippi to the mouth of the Rio Perdido, or Loſt river, ſo called by the Spaniards, becauſe it loſes itſelf under ground, and afterwards appears again, and diſcharges itſelf into the ſea a little to the E. of Mobile, on which the firſt French planters ſettled; up the Perdido to its ſource, and thence (if it riſe not N. of the 31ſt degree of lat.) in a ſtraight line N. to that parallel; thence along the ſouthern boundary of the United States, W. to the Miſſiſippi; then up this river to its ſource, as eſtabliſhed by the treaty of 1783. Beyond this point, the limits, (which have never been accurately aſcertained,) may be conſidered as including the whole country between the White Bear lake, or other head of the Miſſiſippi, and the ſource of the Miſſouri; and between this laſt and the head ſprings of the Arkanſas, Red river, and other copious ſtreams, which fall into the Miſſiſippi; or, in other words, Louiſiana may be conſidered as bounded N. and N.W. by the high lands, which divide the waters that fall into the St. Lawrence and Hudſon's Bay from thoſe which fall into the Miſſiſippi; W. by that high chain of mountains, known by the name of the "Shining Mountains," which may be called the "Spine" or "Andes" of that part of North America, and which turn the waters on the W. of them to the Pacific, and thoſe on the E. to the Atlantic ocean. In a word, it embraces the whole ſlope, or inclined plain, fronting the S.E. and E. down which the various ſtreams flow into the bed of the Miſſiſippi. On the S.W. it is bounded by New Mexico, between which and Louiſiana the diviſional line has never been ſettled. Some pretend that this boundary is a right line from the head of Red river to that of Rio Bravo, and thence down its channel to the gulf of Mexico. Others make the Rio Colerado, and others, with greater probability, make the Rio Mexicano, the S.W. boundary of Louiſiana.

Louiſiana may naturally be divided into the three following diſtricts; *viz.* Eaſtern, Lower, and Upper Louiſiana. The *Eaſtern* diviſion comprehends all that part of this territory which lies E. of the Miſſiſippi, bounded S. by the gulf of Mexico, E. by Perdido river, N. by the Miſſiſippi territory, and W. by the Miſſiſippi river. This diviſion includes the iſland of New Orleans, and is watered by the Mobile, Paſcagoula, Pearl, Boguechito, Tanſipaho, and Amit rivers, with Thompſon's creek, and Bayou Sara. The whole coaſt, embracing the old Biloxi diſtrict, conſiſts of a fine white ſand, injurious to the eyes, and ſo dry as not to be fit to produce any thing but pine, cedar, and ſome ever-green oaks. The Mobile river has few fiſh, and its banks and vicinity are not very fertile. Between Paſcagoula and Miſſiſippi rivers, the country is intermixed with extenſive hills, fine meadows, numerous thickets, and in ſome places woods thickſet with cane, particularly on the banks of rivers and brooks, and proper for agriculture. Its coaſt, though flat, dry, and ſandy, abounds with delicious ſhell and other fiſh, and affords ſecurity againſt the invaſion of an enemy.

Lower Louiſiana comprehends that part of this territory bounded E. by the Miſſiſippi river, S. by the gulf of Mexico, S.W. and W. by New Mexico, N. by a line drawn from the Miſſiſippi W., dividing the country in which ſtone is found from that in which there is none. This part of Louiſiana is watered by Red river, and many others which fall into the gulf of Mexico. On both ſides of the mouths of the Miſſiſippi are quagmires, affording a ſafe retreat for water-fowl, gnats, and moſquitoes, and extending for more than twenty miles. The whole coaſt from the Miſſiſippi, W. as far as St. Bernard's bay and beyond it, reſembles that already deſcribed of the eaſtern diviſion: and the ſoil is barren. In aſcending the Miſſiſippi, beyond the marſhes, are ſome narrow ſtrips of firm land, partly bare of trees and partly thickly covered with them; which are fit for cultivation. This part ſeems to have been either recovered from the ſea, or formed by various materials that have deſcended to it; and it is not unreaſonable to imagine, that in proceſs of time the river and ſea may form another tract of country like Lower Louiſiana. The principal river is the Miſſiſippi; which ſee. The Red river has its ſource not far from that of Rio Bravo, or Rio del Norte, on which the city of Santa Fé is built, and in the mountain which has the ſprings of the Miſſouri. On each ſide of this river are ſome ſcattered ſettlements, for about fifty miles to Bayan Rapide, in which are about 100 families. The land here is not inferior to any in the world with regard to fertility; and for a ſpace of about 40 miles from hence to the commencement of the Appaluſa prairies, the country is equally rich and well-timbered. It is perfectly level, and the ſoil 20 feet deep, and like a bed of manure. Higher up, the banks and low lands are of ſimilar quality with the lands on Bayan Rapide, the texture of the ſoil being ſomewhat looſer; but there are few ſettlements, till you come to the river Cane ſettlements, 60 or 70 miles higher up Red river. Hence to the village or port of Natchitoches, about 50 miles, and 25 miles above it, the banks of one branch of Red river are ſettled like thoſe of the Miſſiſippi, and the country abounds with beautiful fields and plantations, and luxuriant crops of corn, cotton, and tobacco. (See NATCHITOCHES.) The low grounds of Red river, generally five or ſix miles wide, have an uncommonly rich ſoil, which is overflowed annually in the month of April. The crops of corn and tobacco are plentiful, and never fail. The ſoil is particularly favourable for tobacco; an acre yields from 80 to 100 buſhels of corn; and it is no leſs productive of cotton. Two men, with ten or twelve old pots and kettles, ſupply the ſettlement on Red river with ſalt, the ſprings of which are almoſt inexhauſtible. Here is likewiſe plenty of iron and copper ore, pit-coal, ſhell and ſtone lime. The different branches of the river the lakes, creeks, and bayans furniſh abundance of very fine fiſh, cockles, ſoft-ſhelled turtle and ſhrimps, and in winter great varieties of wild fowl. The country is far from being ſickly. The moſchetto is rarely ſeen. The high lands are covered with oak, hickory, aſh, gum, ſaſſafras, dogwood, grape-vines, &c. intermixed with ſhort-leaved pine, and interſperſed with prairies, creeks, lakes, and fountains. Its hills and vallies are gently varied, and the ſoil is generally a ſtony clay. The country on Red river is moſt valuable, beginning about 50 or 60 miles above the upper ſettlements, and extending 4 or 500 miles. The low lands, about 40 miles on each ſide, are remarkably rich, interſperſed with prairies, and beautiful ſtreams and fountains; alſo quarries of free-ſtone, lime, flint, ſlate, grit, and almoſt every kind of ſtone. About 30 miles from the mouth of Red river, Black river falls into it on the N. ſide, which is a clear and navigable ſtream for 5 or 600 miles: about 100 miles upwards, it branches in three different directions: the eaſtern branch, called the Tenſaw, is navigable for many miles, and affords rich land: the middle or main branch, called Waſheta, is navigable 500 miles, and affords excellent lands, ſalt-ſprings, lead-ore, and plenty of very good mill and grindſtones: the weſtern branch, called Catahola, runs through a beautiful, rich, prairie country, in which is a large lake, called Catahola lake. On this lake are ſalt-ſprings, and it abounds with fiſh and fowl. On the river called Ozark are many valuable tracts of land, which is likewiſe the caſe with reſpect to White river and St. François.

Upper Louiſiana comprehends all the remainder of this territory, and is the largeſt and moſt valuable part. It is bound S. by Lower Louiſiana, on the E. by Miſſiſippi, N. and W. by the highlands and mountains which divide the waters of St. Laurence, Hudſon's bay, and the Pacific ocean, from thoſe of the Miſſiſippi. It is watered by the Red river, the Arkanſas, St. Francis, and the Miſſouri, with a vaſt number of ſmaller ſtreams which fall into theſe or the Miſſiſippi. From the lower ſettlement at Sans la Grace, to the upper ſettlement on the Miſſouri, about the diſtance of 250 miles, is a country equal to any part of the weſtern territory, containing a population of 50 or 60,000, and furniſhing lead and iron mines. The ſoil is at the bottom a ſolid red clay, and this is covered by a light earth almoſt black and very fertile. The graſs grows here to a great height, and towards the end of September is ſet on fire; and in eight or ten days after, the young graſs ſhoots up half a foot high. In advancing northwards towards the Arkanſas and St. Francis, the country becomes more beautiful and fertile, abounding in various kinds of game, as beavers, &c. and herds of deer, elks, and buffaloes, from 6 to 100 in a drove. Here have been alſo found ſpecimens of rock cryſtal, plaſter of Paris, lead, and iron ore, lime-ſtone, and pit-coal. It has all the trees known in Europe, beſides others that are there unknown. The cedars are remarkably fine; the cotton trees grow to ſuch a ſize, that the Indians make canoes out of their trunks: hemp grows naturally; tar is made from the pines on the ſea coaſt; and the country affords every material for ſhip-building. Beans grow to a large ſize without culture; peach trees are heavily laden with fruit; and the foreſts are full of mulberry and plum trees. Pomgranate and cheſnut trees are covered with vines, whoſe grapes are very large and ſweet. They have three or four crops of Indian corn in the year: as they have no other winter beſides ſome rains. Here are alſo mines of pitcoal, lead and copper, quarries of free-ſtone, and of black, white, and jaſper-like marble, of which they make their calumets. One ſpecies of timber, which is common from the mouth of the Ohio down the Miſſiſippi ſwamp, is cotton wood, reſembling the Lombardy poplar in the quickneſs of its growth, and the ſoftneſs of the timber. Here are alſo the papaw and black aſh, button wood or ſycamore, hickory, and cypreſs; wild cherry, ſaſſafras, beech, cheſnut, and Bermudian mulberry trees. From the Walnut hills to Point Coupee, and eaſterly 15 or 20 miles, the whole country in its natural ſtate is one continued cane-brake. The cane in general is 36 feet high, often 42; intermingled with a ſmaller ſpecies, which continue thence on all the creeks to the gulf of Mexico.

Above the Nachitoches are the habitations of the Cadodaquiebos Indians; near one of their villages is a rich ſilver mine; another lies further north. Lead ore is alſo found in different places, and alſo iron ore, pit-coal, marble, ſlate, and plaſter of Paris.

As to the climate of this country, during the winter the weather is very changeable, generally throughout Lower, and the ſouthern part of Upper Louiſiana. In ſummer it is regularly hot. In the latitude of the Natchez, Fahrenheit's thermometer ranges from 17° to 96°. The average degree of heat is ſtated to be 14° greater than in Pennſylvania. The climate of Louiſiana varies in proportion as it extends northward. Its ſouthern parts are not ſubject to the ſame degree of heat as the ſame latitudes in Africa, nor its northern parts to the ſame degree of cold as the correſponding latitudes in Europe; owing to the thick woods which cover the country, and to the great number of rivers which interſect it. The prevailing diſeaſes on the lower part of the Ohio, on the Miſſiſippi, and through the Floridas, are bilious fevers. In ſome ſeaſons they are mild, and are little more than common intermittents; in others they are very malignant, and approach the genuine yellow fever of the Weſt Indies.

The total population of all the parts or diſtricts of Louiſiana, including whites, free people of colour, and ſlaves, is 42,375, of whom 12,920 are ſlaves. But it is apprehended that this number is too ſmall. The Spaniſh government is fully perſuaded that the population at preſent conſiderably exceeds 50,000 perſons. The inhabitants of this country are chiefly the deſcendants of the French and Canadians. In New Orleans there is a conſiderable number of Engliſh and Americans. The two German coaſts are peopled by the deſcendants of ſettlers from Germany, and by French mixed with them. The three ſucceeding ſettlements up to Baton Rouge contain moſtly Acadians, baniſhed from Nova Scotia by the Engliſh, and their deſcendants. The government of Baton Rouge, eſpecially on the E. ſide, which includes the whole country between the Ibberville and the American line, is compoſed partly of Acadians, a few French, and a great majority of Americans. On the W. ſide they are moſtly Acadians; at Point Coupee and Fauſſee river they are French and Acadians; of the population of the Atacapas and Opelouſas, a conſiderable part is Americans; Natchitoches, on the Red river, contains but a few Americans, and the reſt of the inhabitants are French; but the former are more numerous in the other ſettlements on that river, *viz.* Avoyelles, Rapide, and Ouacheta. At Arkanſas they are moſtly French; and at New Madrid, Americans. At leaſt two-fifths, if not a greater proportion of all the ſettlers on the Spaniſh ſide of the Miſſiſippi, in the Illinois country, are likewiſe ſuppoſed to be Americans. Below New Orleans the population is altogether French, and the deſcendants of Frenchmen. The natives of the ſouthern part of the Miſſiſippi are ſprightly; they have a turn for mechanics, and the fine arts; but their ſyſtem of education is ſo wretched, that little real ſcience is obtained. Many of the planters are opulent, induſtrious, and hoſpitable. There is a militia in Louiſiana, amounting, as it is ſaid, to about 10,340. The Indian nations within the limits of Louiſiana, are as follow, according to the ſtatement of the late preſident of the United States, Mr. Jefferſon: on the E. bank of the Miſſiſippi, about 25 leagues above Orleans, are the remains of the Houmas or Red men, amounting to about 60 perſons; on the W. ſide of the ſame river are the remains of the Tounicas, ſettled near and above Point Coupee, conſiſting of 50 or 60 perſons. In the Atacapas, on the lower part of the Bayou Teche, about 11 or 12 leagues from the ſea, are two villages of Chitimachas, conſiſting of about 100 perſons; the Atacapas, properly ſo called, diſperſed throughout the diſtrict, are about 100; and there are about 50 wanderers of the tribes of Biloxis and Choctaws on Bayou Crocodile, which empties into the Teche. In the Opelouſas, N.W. of Atacapas, are two villages of Alibamas in the centre of the diſtrict, conſiſting of 100 perſons; and the Conchates diſperſed through the country as far as the Sabinas and its neighbourhood, are about 350. On the river Rouge, at Avoyelles, 19 leagues from the Miſſiſippi, is a village of the Biloni nation, and another on the lake of the Avoyelles, the whole including about 60 perſons. At the Rapide, 26 leagues from the Miſſiſippi, is a village of Choctaws, conſiſting of 100 perſons, and another of Biloxes, about two leagues from it, of about 100 more; and at about eight or nine leagues higher up the Red river is a village including about 50 perſons. All theſe are occaſionally employed by the ſettlers as boatmen. About eighty leagues above Natchitoches on the Red river is the nation of the Cadoquies, or Cados, who can raiſe from three to four hundred warriors, the friends of the whites, and eſteemed the braveſt and moſt generous of all the nations in this vaſt country; they are rapidly declining by their intemperance, and by the attacks of the Oſages and Choctaws. There are 500 families of the Choctaws, diſperſed on the W. ſide of the Miſſiſippi, on the Ouacheta and Red rivers, as far W. as Natchitoches. On the river Arkanſas is a nation of the ſame name, conſiſting of about 260 warriors, brave, yet peaceable and well-diſpoſed, attached to the French, and diſpoſed to engage in their wars with the Chickaſaws. They live in three villages at 18 leagues from the Miſſiſippi on the Arkanſas river, and the others are at three and ſix leagues from the firſt. A ſcarcity of game on the E. ſide of the Miſſiſippi has induced a number of Cherokees, Choctaws, Chickaſaws, &c. to frequent the neighbourhood of Arkanſas, where game is ſtill abundant, where they have contracted marriages with the Arkanſas, and incorporated themſelves with that nation. On the river St. Francis, in the vicinity of New Madrid, &c. are ſettled a number of vagabonds from the Delawares, Shawneſe, Miamis, Chickaſaws, Cherokees, Piorias, ſuppoſed to conſiſt in all of 500 families. They are piratical in their diſpoſition, attached to liquor, unſettled and vagrant in their habits, ſome of them ſpeak Engliſh, all underſtand it, and ſome of them can even read and write it. At St. Genevieve, about 30 Piorias, Kaſkaſkias and Illinois, are ſettled among the whites. Theſe are the remains of a nation, which 50 years ago could bring into the field 1200 warriors.

On the Miſſouri and its waters, are many and numerous nations, the beſt known of which are; the Oſages, ſituated on the river of the ſame name on the right bank of the Miſſouri, at about 80 leagues from its confluence with it; they conſiſt of 1000 warriors, who live in two ſettlements at no great diſtance from each other. They are of a gigantic ſtature and well proportioned, are enemies of the whites and of all other Indian nations, and commit depredations from the Illinois to the Arkanſas. The trade of this nation is ſaid to be under an excluſive grant. They are a cruel and ferocious race, and are hated and feared by all the other Indians. The confluence of the Oſage river with the Miſſouri is about eight leagues from the Miſſiſippi. Sixty leagues higher up the Miſſouri, and on the ſame bank, is the river Kanzas, and on it the nation of the ſame name; but at about 70 or 80 leagues from its mouth. It conſiſts of about 250 warriors, who are as fierce and cruel as the Oſages, and often moleſt and ill treat thoſe who go to trade among them. Sixty leagues above the river Kanzas, and at about 200 from the mouth of the Miſſouri, ſtill on the right bank, is the Rivierre Platte, or Shallow river, remarkable for its quickſands and bad navigation; and near its confluence with the Miſſouri dwells the nation of Octolactos, commonly called Otos, conſiſting of about 200 warriors, among whom are 25 or 30 of the nation of Miſſouri, who took refuge among them about 25 years ſince. Forty leagues up the river Platte you come to the nation of Panis, compoſed of about 700 warriors in four neighbouring villages; they hunt but little, and are ill provided with fire arms; they often make war on the Spaniards in the neighbourhood of Sante Fé, from which they are not far diſtant. At 300 leagues from the Miſſiſippi, and 100 from the river Platte on the ſame banks, are ſituated the villages of the Mahas. They conſiſted, in 1799, of 500 warriors, but are ſaid to have been almoſt cut off laſt year by the ſmall-pox. At 50 leagues above the Mahas, and on the left bank of the Miſſouri, dwell the Poncas, to the number of 250 warriors, poſſeſſing in common with the Mahas, their language, ferocity, and vices. Their trade has never been of much value, and thoſe engaged in it are expoſed to pillage and ill treatment. At the diſtance of 450 leagues from the Miſſiſippi, and on the right bank of the Miſſouri, dwell the Aricaras, to the number of 700 warriors, and 60 leagues above them, the Mandane nation, conſiſting of about 700 warriors likewiſe. Theſe two laſt nations are well diſpoſed to the whites, but have been the victims of the Sioux, or Mandoweſſies, who being themſelves well provided with fire-arms, have taken advantage of the defenceleſs ſituation of the others, and have on all occaſions murdered them without mercy. No diſcoveries on the Miſſouri, beyond the Mandane nation, have been accurately detailed, though the traders have been informed, that many navigable rivers diſcharge their waters into it, above it, and that there are many numerous nations ſettled on them. The Sioux, or Mandoweſſies, who frequent the country between the N. bank of the Miſſouri and Miſſiſippi, are a great impediment to trade and navigation. They endeavour to prevent all communication with the nations higher up the Miſſouri, to deprive them of ammunition and arms, and thus keep them ſubſervient to themſelves. In the winter they are chiefly on the banks of the Miſſouri, and maſſacre all who fall into their hands. There are a number of nations at a diſtance from the banks of the Miſſouri, to the N. and S. concerning whom but little information has been received. Returning to the Miſſiſippi, and aſcending it from the Miſſouri, about 75 leagues above the mouth of the latter, the river Moingona, or Riviere de Moine, enters the Miſſiſippi on the weſt ſide, and on it are ſituated the Ayoas, a nation originally from the Miſſouri, ſpeaking the language of the Otachatas; it conſiſted of 200 warriors before the ſmall-pox lately raged among them. The Saes and Renards dwell on the Miſſiſippi, about 300 leagues above St. Louis, and frequently trade with it; they live together, and conſiſted of 500 warriors; their chief trade is with Michilimakinack, and they have always been peaceable and friendly. The other nations on the Miſſiſippi, higher up, are but little known to us. The Sac and Fox nations of India have ceded to the United States a valuable country, with a front of 600 miles on the Miſſiſippi. It contains 80,000 ſquare miles, and is equal to 51,200,000 acres. The treaty ceding this territory, was ſigned at St. Louis, the 3d of Nov. The nation of the Miſſouri, though cruel, treacherous, and inſolent, may doubtleſs be kept in order by the United States, if proper regulations are adopted with reſpect to them. It is ſaid, that no treaties have been entered into by Spain with the Indian nations weſtward of the Miſſiſippi, and that its treaties with the Creeks, Choctaws, &c. are in effect ſuperſeded by our treaty with that power of the 27th October 1795.

The productions of Louiſiana are ſugar, cotton, indigo, rice, furs, and peltry, lumber, tar, pitch, lead, flour, horſes, and cattle. The ſoil is fertile, the climate ſalubrious, and the means of communication between moſt parts of the province certain, and by water. The exports of Louiſiana amount in value to 2,158,000 dollars; and the imports, in merchandize, plantation utenſils, ſlaves, &c. amount to 2½ millions, the difference being made up by the money introduced by the government, to pay the expences of governing and protecting the colony. The imports to the United States from Louiſiana and the Floridas amounted in 1802 to 1,006,214 dollars, and the exports to Louiſiana and the Floridas in the ſame year to 1,224,710 dollars. In Louiſiana there are few domeſtic manufactures. The Acadians manufacture a little cotton into quilts and cottonades, and in the remoter parts of the province, the poorer planters ſpin and weave ſome negro cloths of cotton and wool mixed. In the city, beſides the trades which are abſolutely neceſſary, there is a conſiderable manufacture of cordage, and four ſmall ones of ſhot and hair powder; and within a few leagues of the town are twelve diſtilleries for making taffia, which are ſaid to diſtil annually a conſiderable quantity, and one ſugar refinery, which is ſaid to make about 200,000lbs. of loaf ſugar. There are no colleges, and but one public ſchool, which is at New Orleans. There are a few private ſchools for children. Not more than half of the inhabitants are able to read and write. In general the learning of the inhabitants does not extend beyond thoſe two arts; though they ſeem to be endowed with a good natural genius, and a good and an uncommon facility of learning whatever they undertake. The clergy conſiſts of a biſhop, who does not reſide in the province, whoſe ſalary of 4000 dollars is charged on the revenue of certain biſhoprics in Mexico and Cuba; two canons, and 25 curates, receive each from 360 to 480 dollars a-year. At Orleans there is a convent of Urſulines, to which is attached about 1000 acres of land. Raynal, Jefferſon, Morſe.

LOUISTOWN, a town of America, in Talbot county, Maryland, on the W. ſide of Tuckahoe creek; four miles N. of King's-town.

LOUISVILLE, a port of entry, poſt-town of Kentucky, and capital of Jefferſon county, pleaſantly ſituated on the left ſide of the Ohio, on an elevated plain above the Rapids, nearly oppoſite to Fort Fenny. It commands a delightful proſpect, but the ſtagnated waters behind it render it unhealthy. It conſiſts of three principal ſtreets, and contains about 100 houſes, 350 inhabitants, a court-houſe, and gaol; 40 miles W. of Frankfort.—Alſo, the preſent ſeat of government in Georgia, ſituated in Jefferſon county, in the lower diſtrict of the ſtate, on the N.E. bank of the Great Ogeechee river, 70 miles from its mouth. It contains a ſtate-houſe, a tobacco warehouſe, and upwards of forty dwelling houſes. In the vicinity is ſituated a liberally endowed college; 52 miles S.E. of Auguſta. N. lat. 32° 55′. W. long. 82° 42′.

LOULAY, a town of France, in the department of the Lower Charente, and chief place of a canton, in the diſtrict of St. d'Angely, and ſix miles N. of it. The place contains 366, and the canton 7161 inhabitants, on a territory of 167½ kiliometres, in 19 communes.

LOULE', a town of Portugal, in the province of Algarva, on a river of the ſame name, near the ſea; ſurrounded with antique walls, and containing a caſtle, hoſpital, three convents, and about 4400 inhabitants; nine miles N. of Faro. N. lat. 37° 8′. W. long. 7° 54′.

LOULIE', François, in *Biography*, a French muſician, who publiſhed in 1696 an ingenious and uſeful book, intitled "Elements of Muſic," with a deſcription of a chronometer to meaſure time by a pendulum. See Chronometer, and its deſcription, from this book, in Malcolm, p. 407, and in 1698, another book was printed by Etienne Roger, at Amſterdam, called "A New Syſtem of Muſic," by the ſame author. In this work, beſides the uſual inſtructions in elementary books, he explains the nature of tranſpoſition, and propoſes a method of reducing a piece of muſic into any key different from that in which it was originally compoſed, by means of imaginary clefs. See Transposition, and Dr. Pepuſch's "Treatiſe on Harmony."

LOUNG, in *Geography*, a town of Hindooſtan, in the circar of Schaurumpour; 28 miles S. of Merat.

LOU-NGHAN, a city of China, of the firſt rank, in the province of Chen-ſi. N. lat. 36° 42′. E. long. 116° 42′.

LOUP, a river of France, which runs into the Mediterranean. N. lat. 43° 38′. E. long. 7° 12′.—Alſo, a river of Canada, which runs into the lake St. Pierre. N. lat. 46° 13′. E. long. 72° 47′.

Loup, *St.*, a town of France, in the department of the Upper Saone, and chief place of a canton, in the diſtrict of Lure; ſix miles N.W. of Luxeuil. The place contains 1891, and the canton 13,366 inhabitants, on a territory of 195 kiliometres, in 14 communes.—Alſo, a town of France, in the department of the Two Sevres, and chief place of a canton, in the diſtrict of Parthenay, near the river Thoue; nine miles N.N.E. of Parthenay. The place contains 1649, and the canton 5968 inhabitants, on a territory of 197½ kiliometres, in nine communes.

Loup *de Salle, St.*, a town of France, in the department of the Saone and Loire, near the river Heune; 11 miles N. of Chalons ſur Saone.

LOUPPE, La, a town of France, in the department of the Eure and Loire, and chief place of a canton, in the diſtrict of Nogent-le-Rotrou; 18 miles W. of Chartres. The place contains 1178, and the canton 10,315 inhabitants, on a territory of 245 kiliometres, in 21 communes.

LOUPTIERE, John Charles de Relongue, in *Biography*, was born in the dioceſe of Sens in 1727; he became a member of the academy of the Arcadi at Rome, and died in the year 1784. He is known by a collection of poems in two volumes 12mo., written with much ſpirit and elegance; and by ſix parts of a Journal for ladies printed in 1761.

LOURDE, in *Geography*, a town of France, in the department of the Higher Pyrenées, and chief place of a canton, in the diſtrict of Argelés; ſix miles N. of Argelés. The place contains 2741, and the canton 10,418 inhabitants, on a territory of 180 kiliometres, in 27 communes. N. lat. 43° 6′. E. long. 0° 1′.

LOURE, in *French Muſic*, a kind of dance, of which the tune is rather ſlow, and generally in the meaſure of $\frac{6}{4}$, or ſix crotchets in a bar. *Loure* is likewiſe the name of an inſtrument reſembling a bagpipe, to the muſic of which the tune is danced.

LOURER is a verb, which implies ſuſtaining and cheriſhing the times of a movement, in oppoſition to *détaché*, ſeparated.

LOUREZA, in *Geography*, a town of Spain, in Galicia; eight miles W. of Tuy.

LOURIÇAL, a town of Portugal, in the province of Eſtramadura; ſix miles N. of Leyria.

LOURINHA, a town of Portugal, in the province of Entre Duero é Minho; 8 miles S.S.E. of Peniche.

LOURISTAN. See Laristan.

LOUROUX-BECONNOIS, Le. See Loroux. The place contains 2018, and the canton 6855 inhabitants, on a territory of 227½ kiliometres, in ſeven communes.

LOUS, Λῶς, in *Chronology*, the Macedonian name for the Athenian month Hecatombæon, which was the firſt of their year, and anſwered to the latter part of our June and the beginning of July.

LOUSE, in *Zoology*. See Pediculus. This creature has ſo tranſparent a ſhell, or ſkin, that we are able to diſcover more of what paſſes within its body, than in moſt other living creatures. It has naturally three diviſions, the head, the breaſt, and the tail part. In the head appear two fine black eyes, with a horn that has five joints, and is ſurrounded with hair ſtanding before each eye; and from the end of the noſe, or ſnout, there is a pointed projecting part, which ſerves as a ſheath or caſe to a piercer, or ſucker, which the creature thruſts into the ſkin, to draw out the blood and humours which are its deſtined food; for it has no mouth that opens in the common way. This piercer or ſucker is judged to be ſeven hundred times ſmaller than a hair, and is contained in another caſe within the firſt, and can be thruſt out or drawn in at pleaſure. (Baker's Microſcope, p. 177.) The breaſt is very beautifully marked in the middle, the ſkin is tranſparent, and full of little pits; and from the under part of it proceed ſix legs, each having five joints, and their ſkin all the way reſembling ſhagreen, except at the ends, where it is ſmoother. Each leg is terminated by two claws, which are hooked, and are of an unequal length and ſize; theſe it uſes as we would a thumb and a middle finger, and there are hairs between theſe claws as well as all over the legs. Lewenhoeck's Arcan. Nat. tom. ii. p. 74.

On the back of the tail part there may be diſcovered ſome ring-like diviſions, abundance of hairs, and a ſort of marks which look like the ſtrokes of a rod on a child that has been whipped; the ſkin of the belly ſeems like ſhagreen, and towards the lower end is very clear, and full of pits: at the extremity of the tail there are two ſemicircular parts, covered all over with hairs, which ſerve to conceal the anus.

When the louſe moves its legs, the motion of the muſcles, which all unite in an obglon dark ſpot in the middle of the breaſt, may be diſtinguiſhed perfectly, and ſo may the motion of the muſcles of the head when it moves its horns. We may likewiſe ſee the various ramifications of the veins and arteries, which are white, with the pulſe regularly beating in the arteries. But the moſt ſurpriſing of all the ſights is the periſtaltic motion of the guts, which is continued from the ſtomach down to the anus. Philoſ. Tranſ. N° 102.

If one of theſe creatures, when hungry, be placed on the back of the hand, it will thruſt its ſucker into the ſkin, and the blood it ſucks may be ſeen paſſing in a fine ſtream to the fore-part of the head; where falling into a roundiſh cavity, it paſſes again in a fine ſtream to another circular receptacle in the middle of the head; from thence it runs through a ſmaller veſſel to the breaſt, and then to a gut which reaches to the hinder part of the body, where in a curve it turns again a little upward. In the breaſt and the gut the blood is moved without intermiſſion with a great force, eſpecially in the gut; and that with ſo ſtrong a propulſion downward, and ſuch a contraction of the gut, as is very ſurpriſing. Power's Mic. Obſ. 9.

In the upper part of the crooked aſcending gut before mentioned, the propelled blood ſtands ſtill, and ſeems to undergo a ſeparation; ſome of it becoming clear and wateriſh, while other little black particles paſs downward to the anus.

If a louſe be placed on its back, two bloody darkiſh ſpots appear; the larger in the middle of the body, the leſſer toward the tail. In the larger ſpot, a white film or bladder contracts and dilates upwards and downwards from the head toward the tail, the motions of which are followed by a pulſation of the dark bloody ſpot, in or over which the white bladder ſeems to lie. This motion of the ſyſtole and diaſtole is beſt ſeen when the creature begins to grow weak; and on pricking the white bladder, which ſeems to be the heart, the creature always inſtantly dies. The lower dark ſpot is ſuppoſed to be the excrements in the guts.

Lice have been ſuppoſed to be hermaphrodites, but this is erroneous; for Mr. Lewenhoeck diſcovered that the males have ſtings in their tails, which the females have not. And he ſuppoſes the ſmarting pain theſe creatures ſometimes give to be owing to their ſtinging with theſe ſtings, when made uneaſy by preſſure or otherwiſe. This accurate obſerver ſays, that he felt little or no pain from their ſuckers, though ſix of them were feeding on his hand at once.

The ſame accurate obſerver determining to know their true hiſtory and manner of breeding, put two females into a black ſtocking, which he wore night and day. He found, on examination, that in ſix days one of them had laid above fifty eggs; and upon diſſecting it, he found as many yet remaining in the ovary; whence he concludes, that in twelve days it would have laid a hundred eggs. Theſe eggs naturally hatch in ſix days, and would then probably have produced fifty males and as many females; and theſe females coming to their full growth in eighteen days, might each of them be ſuppoſed after twelve days more to lay a hundred eggs; which eggs in ſix days more, might produce a young brood of five thouſand; ſo that in eight weeks one louſe may ſee five thouſand of its own deſcendants. A louſe may be eaſily diſſected in a ſmall drop of water upon a ſlip of glaſs; and thus placed before the microſcope, it is common to find five or ſix eggs of a ſize ready to be laid, and ſixty or ſeventy others of different bigneſs. In the male the penis is very remarkably diſtinct, as are alſo the teſtes, of which he ſeems to have a double pair, as is alſo the ſting, the ſtructure of which merits a peculiar attention. Lewenhoeck's Arcan. Natur. tom. ii. p. 78.

Many animals, both of the quadruped and flying kinds, are ſubject to lice: but theſe are of peculiar ſpecies on each animal, and are not at all like thoſe which infeſt the human body. Nay, even inſects are infeſted with vermin, which feed on them and torment them. Several kinds of beetles are very ſubject to lice; but particularly that kind called thence the *louſy beetle*. The lice on this are very numerous, but will not be ſhook off. The ear-wig is often infeſted with lice juſt at the ſetting on of its head; theſe are white and ſhining like mites, but they are much ſmaller; they are round-backed, flat-bellied, and have long legs, particularly the foremoſt pair. Snails of all kinds, but eſpecially the large naked kinds, are very ſubject to lice, which are continually ſeen running about them, and devouring them. Numbers of little red lice, with a very ſmall head, and in ſhape reſembling a tortoiſe, are often ſeen about the legs of ſpiders, and they never leave the ſpider while he lives, but if he be killed, they almoſt inſtantly forſake him. A ſort of whitiſh lice are very common on humble-bees; they are alſo found on ants; and many ſorts of fiſhes are not leſs ſubject to them than the land animals. Kircher ſays, that he has found lice alſo on flies. Baker's Microſcope, p. 182.

Signior Redi, who has more accurately examined theſe creatures than any other author, has engraved ſeveral ſpecies found on different animals. He calls thoſe found on beaſts lice, and thoſe found on birds fleas. He is of opinion, that every ſpecies of birds has its peculiar ſort of flea, different from thoſe of other birds; and has obſerved that they are hatched white, but that they gradually acquire a colour, like that of the feathers they live among, yet they uſually remain tranſparent enough for a good microſcope to diſcover the motion of their inteſtines. The kinds he has obſerved are theſe: on the hawk three different ſorts; on the large pigeon, the turtle-dove, the hen, the ſtarling, the crane, the magpie, the heron, the leſſer heron, the ſwan, the turkey, the duck, the ſea-mew, the ſmall ſwan, the teal, the caſtrel, the peacock, the capon, and the crow, on each one ſort; on the moor-hen three ſorts; on the wild gooſe two ſorts; and on the crane, beſide the common one, a white ſort, marked, as it were, with Arabic characters. Men, he obſerves, are ſubject to two kinds, the common louſe, and that called the *crab* louſe. He alſo found peculiar ſorts on the goat, the camel, the aſs, the African ram, the ſtag, which has, like many of the birds, two kinds, and on the lion and the tyger. The ſame author has obſerved, that the ſize of theſe creatures is not at all proportioned to that of the animal they are to inhabit, for the ſtarling has them as large as the ſwan. Redi, Gen. Inſ. p. 312.

It is obſervable, that ſome ſort of conſtitutions are more apt to breed lice than others; and that in certain places of different degrees of heat, they are very certain to be deſtroyed upon people, who in other climates are overrun with them. It is an obſervation of Oviedo, that the Spaniſh ſailors, who are generally much afflicted with lice, always loſe them in a certain degree in their voyage to the Indies, and have them again on their coming to the ſame degree at their return: this is not only true of the Spaniards, but of all other people who make the ſame voyage; for though they ſet out ever ſo louſy, they have not one of theſe creatures to be found after they come to the tropic. And in the Indies there is no ſuch thing as a louſe about the body, though the people be ever ſo naſty. The ſailors continue free from theſe creatures till their return; but in going back they uſually begin to be louſy, after they come to about the latitude of Madeira. The extreme ſweats which the working people naturally fall into between this latitude and the Indies, drown and deſtroy the lice, and are of the ſame effect as the rubbing over the louſy heads of children with butter and oil. The ſweat in and about the Indies is not rank as in Europe, and therefore it is not apt to breed lice; but when the people return into latitudes where they ſweat rank again, their naſtineſs ſubjects them to the ſame viſitations of theſe vermin which it uſed to have.

The people in general, in the Indies, are very ſubject to lice in their heads, though free from them in their bodies. The reaſon of this is, that their heads ſweat leſs than their body, and they take no care to comb and clean them. The Spaniſh negroes waſh their heads thoroughly once every week with ſoap, to prevent their being louſy. This makes them eſcape much better than the other negroes who are ſlaves there, for the lice grow ſo numerous in their heads, that they often eat large holes in this part.

M. de la Hire has given a curious account of the creature which he found on the common fly. Having occaſion to view a living fly by the microſcope, he obſerved on its head, back, and ſhoulders, a great number of ſmall animals, crawling very nimbly about, and often climbing up the hairs, which grow at the origin of the fly's legs. He, with a fine needle, took up one of theſe, and placed it before the microſcope, uſed to view the animalcules in fluids. It had eight legs, four on each ſide; they were not placed very diſtant from one another, but the four toward the head were ſeparated by a ſmall ſpace from the four toward the tail. The feet were of a particular ſtructure, being compoſed of ſeveral fingers, as it were, and fitted for taking faſt hold of any thing; the two neareſt the head were alſo more remarkable in this particular than thoſe near the tail; the extremities of the legs, for a little way above the feet, were dry and void of fleſh, like the legs of birds, but above this part they appeared plump and fleſhy. It had two ſmall horns upon its head, formed of ſeveral hairs arranged cloſely together; and there were ſome other cluſters of hairs by the ſide of theſe horns, but they had not the ſame figure; and toward the origin of the hinder legs there were two other ſuch cluſters of hairs, which took their origin at the middle of the back. The whole creature was of a bright yellowiſh red; and the legs, and all the body, except a large ſpot in the centre, were perfectly tranſparent. In ſize, the author believes it was about $\frac{1}{4000}$dth part of the bigneſs of the head of the fly; he obſerves, that it is rarely that flies are found infeſted with them. Mem. Acad. Par. 1693.

Louse, *Tree.* See Aphis.

Louse, *Wood.* See Millepedes.

Louse-*wort*, in *Botany.* See Pedicularis.

Louse-*wort*, *Yellow.* See Rhinanthus.

The Dutch carry on a trade with the ſeeds and ſeed-veſſels of a ſpecies of this plant, reſembling the common yellow meadow louſe-wort, to Germany, and call it *ſemen ſaradillos*; they uſe it for deſtroying bugs: for this purpoſe, they boil a quantity of the ſeeds and capſules in common water, with which they waſh their wainſcots, bedſteads, &c. where theſe inſects are lodged; and thus they are effectually deſtroyed. Miller.

LOU-TCHOU, in *Geography*, a river of Thibet, which runs into the Sampoo; 22 miles S.W. of Tankia.

LOUTESTINA, a town of Croatia; 12 miles S. of Creutz.

LOUTH, a large market town in the wapentake of Louth Eſke, in the Lindſay diviſion of Lincolnſhire, England, is ſituated in a fertile valley at the eaſtern foot of the Wolds, 26 miles diſtant from Lincoln, and 153 from London. It was anciently called *Luda*, from its proximity to the Ludd, a ſmall rivulet formed by the confluence of two ſtreams. Among the few hiſtorical events relative to Louth, we find that in the rebellion of the year 1536, occaſioned by the ſuppreſſion of the religious houſes, the inhabitants took an active part, under Dr. Mackerel, who was known by the name of captain Cobler, when the prior of Barling's abbey, with the vicar and thirteen other ring-leaders, ſuffered death. In this town were anciently eſtabliſhed three religious fraternities, called "The Guild of our Bleſſed Lady, the Guild of the Holy Trinity, and the Chantry of John of Louth." King Edward VI. alienated the funds of theſe guilds, and granted them for the purpoſe of erecting and endowing a free grammar ſchool. The lands then produced 40*l. per annum*, but are now let at 400*l.* One-half of the produce was granted for a head maſter's ſalary, one-fourth for the uſher's, and the remainder for the perpetual maintenance of twelve poor women. The truſtees of this foundation were incorporated by the name of "The warden and ſix aſſiſtants of the town of Louth, and free-ſchool of king Edward VI. in Louth." Another free-ſchool, on a very reſpectable ſcale, was founded in purſuance of the will of Dr. Mapletoft, dean of Ely, bearing date Auguſt 17th, 1677. The church of St. James is a ſpacious edifice, conſiſting of a nave, two aiſles, with an elegant tower and ſpire at the weſt end. The eaſt end, which preſents a fine elevation, exhibits a large central window, having ſix upright mullions and varied tracery, with two lateral windows opening into the aiſles. Internally the nave is ſeparated from the aiſles by octagonal columns, the alternate ſides of which are relieved by ſingle flutes. The chancel, which has an altar piece containing a picture of the Deſcent from the Croſs by Williams, is of more modern date than the body of the church, and is probably coeval with the juſtly admired ſteeple. The latter was begun in the year 1501, and completed in fifteen years. The height was originally 360 feet; but the flat ſtone on the ſummit was blown off in 1587, and carried with it part of the building into the body of the church. The whole ſpire being blown down October 11th, 1634, the preſent one was erected. The tower part of the ſteeple conſiſts of three ſtories: each ſtage terminates with elegant pediments, ſupported by ornamental corbels; in this manner diminiſhing to the top, where are four octagonal embattled turrets. At eighty feet from the baſe, round the exterior of the tower, runs a gallery, guarded by a parapet wall; and at the height of 170 feet the battlements commence. The top ſtone projects with a cornice; the height of the ſpire to the croſs is 141 feet; the total height of the whole 288 feet. The living of St. James is a vicarage, in the gift of a prebendary of Lincoln cathedral, to which it was annexed by the Conqueror. The vicarage houſe, which ſtands contiguous to the church-yard, is an old thatched building; and the preſent vicar has, in uniſon with its appearance, laid out his garden in a curious ſtyle of ingenious ruſticity: it is denominated the hermitage. In Louth was formerly another church, named St. Mary's; it is now totally demoliſhed; but the church-yard is the place of ſepulture for the town, as that of St. James has not been uſed for that purpoſe for forty years paſt. The Diſſenters from the eſtabliſhment have three places of worſhip; one for Catholics, one for Baptiſts, and one for Methodiſts. The other principal buildings are a town-hall, an aſſembly room, and a theatre. The civil government of the town is veſted in the warden and ſix aſſiſtants, incorporated, as already mentioned, by Edward VI., who in the ſame charter granted two markets to be held on Wedneſdays and Saturdays, and three fairs to commence on the third Sunday after Eaſter, St. James's day, and the feaſt of St. Martin; with a particular injunction, that they ſhould continue two whole days after, that the firſt day of each fair might be appropriated "to hearing the word of God." Queen Elizabeth gave to the corporation the manor of Louth, of which the annual value was then 78*l.* 14*s.* 4½*d.* for the better ſupport of the corporate dignity; and ſome additional privileges were granted by by James I. In the year 1801, the inhabitants of Louth, as appears by the return under the population act, were 4236, and the number of houſes 950; but a conſiderable increaſe has been made ſince that time. A carpet and blanket manufactory has been recently eſtabliſhed here, and is now in a very proſperous ſtate; here is alſo a large manufactory of ſoap, and a mill for making coarſe paper. In the year 1761 an act was obtained for cutting a canal between Louth and the North ſea. It commences about half a mile from the town, and keeps parallel with the Ludd, which ſupplies it with water; leaving the river about four miles from the town, it ſweeps to the north and joins the ſea at a place called Tetney lock. The undertaking coſt 12,000*l.*, which brings in very good intereſt. By this channel veſſels of conſiderable burthen regularly trade to London, Hull, and ſeveral parts of Yorkſhire, carrying out corn and wool, and bringing home timber, coals, grocery, &c. In Louth and its vicinity are various ſprings of a very peculiar nature, worthy of inveſtigation by the philoſopher and chemiſt.

About a mile from the town is the ſcite of Louth Park abbey, which was built by Alexander, biſhop of Lincoln, in the year 1139, and appropriated to Ciſtercian monks. In the time of Henry III. this houſe contained 66 monks and 150 converts or labourers. Beauties of England and Wales, vol. ix. See alſo an account of Louth Church and Plan of the Town, publiſhed by Mr. T. Eſpin, a reſpectable ſchoolmaſter of Louth.

Louth, a county of Ireland, which, though uſually reckoned in Leinſter, bears a great reſemblance in many particulars to the adjoining ones in Ulſter. It is bounded on the N. by the county of Armagh; on the N.E. by the bay of Carlingford, which ſeparates it from Down; on the E. by the Iriſh ſea; on the S. by Meath, and on the W. by this laſt county and Monaghan. It is the ſmalleſt county in Ireland; its greateſt length being only 21 Iriſh (near 27 Engliſh) miles, and its breadth 14 Iriſh (18 Engliſh) miles. The number of acres in Iriſh meaſure is 110,750, equal to 173 ſquare miles, which in Engliſh meaſure is about 177,926 acres, or 278 ſquare miles. Small as it is, it contains 61 pariſhes in the dioceſe of Armagh, and its population many years ago was eſtimated at 57,750. Louth is in general a rich and well cultivated tract, in which there is very little waſte ground, and the population of which is very great. Though not deficient in thoſe undulations of the ground which render a country intereſting, it cannot be called hilly, except in the peninſula between the bays of Carlingford and Dundalk, and on the confines of Armagh. It is very much under tillage, and more attention is paid to agricultural improvement than in moſt other parts of the iſland, which may in great meaſure be attributed to the exertions of the late lord chief baron Forſter, who is called by Arthur Young "the prince of reformers," and of his ſon the Rt. Hon. John Forſter, who has not only followed up his father's meaſures, but in the high public offices he has held, has been an active promoter of agriculture throughout Ireland, by the laws he propoſed for its encouragement. The crops conſiſt of wheat, barley, oats, flax and potatoes, and there is alſo a great deal of peas and red clover. Limeſtone is found in a ſmall tract adjoining the county of Meath in the ſouth, in the neighbourhood of Carlingford, and at Caſtletown, on the confines of Armagh, but not in the country between Drogheda and Dundalk. This valuable manure is, however, procured at a moderate expence, and contributes to the improvement of the ſoil. At ſome depth in the bogs under the turf there is fine white ſhelly marle in great abundance, which is alſo found a very uſeful manure. Thoſe who live near the ſea-coaſt alſo avail themſelves of their ſituation to uſe weeds which are found there. The mineral treaſures of Louth do not ſeem to be great. Some ochres and ſoap rock are mentioned, and formerly a lead mine was wrought at Salterſtown, on the ſea-coaſt, in the neighbourhood of Caſtlebellingham; but the riches of Louth conſiſt in the produce of its cultivated lands. The ſtone chiefly found is the ſame as that found in Armagh and Monaghan, and called *whinſtone*, but which differs from other ſtones ſo called. It is hard, but not ſo much ſo as to ſtrike fire with ſteel. Sir C. Coote ſays, that it contains 46 parts of ſilica, 22 of alumine, 28 oxyd of iron, and four of lime in the 100 parts. The principal river of this county is the Boyne, which flowing from Meath, becomes the ſouthern boundary, about two miles W. of Drogheda, and falls into the ſea about two miles below that town. It is a river capable of affording great advantages to the country through which it paſſes. (See Boyne.) Several other ſmall rivers croſs the county and fall into the bay of Dundalk. The towns of Carlingford, Dundalk, Drogheda, and Collon, have been already noticed under their reſpective names. Of theſe Dundalk is the aſſize town, and Drogheda returns one member, ſo that the county has three repreſentatives. There are in Louth a greater number than in any other part of Ireland of thoſe high artificial mounts, the fortreſſes of early ages which the Iriſh call raths, and attribute to the Danes. In Wright's Louthiana will be found a full account of theſe antiquities, many of which are noticed in different articles of this work. Louth was early colonized by the Engliſh and was within the Pale. It had a large ſhare of the diſturbances which have afflicted Ireland. Beaufort, Young, &c.

Louth, a townſhip of Upper Canada, W. of Grantham, and fronting lake Ontario.

LOUTRA, Great and Little, two ſmall Greek iſlands in the gulf of Engia; ſeven miles N.W. of Engia.

LOVTZOVA, a town of Ruſſia, in the government of Irkutſk; 10 miles N.E. of Verchnei Udinſk.

LOUVAIN, a city of France, and principal place of a diſtrict, in the department of the Dyle. The number of inhabitants is eſtimated at 18,000, in two cantons, one conſiſting of 17,796 inhabitants, on a territory of 87½ kilometres in 12 communes, and the other containing 18,230, on a territory of 140 kilometres, in 15 communes. This city was formerly the capital of Brabant, and as ſome ſay, probably without ſufficient authority, founded by Julius Cæſar, or by one Lupus, who lived long before him; it is certain, however, that this place was known in the year 885, when Godfrey, duke of Normandy, having ravaged the country, encamped near the Dyle, on the plain of Louvain. The emperor Arnulph built a caſtle about this time to defend the country againſt the Normans, which was called "Loven," or "le Chateau de Cæſar," Cæſar's caſtle, and was a long time the ordinary reſidence of the dukes of Brabant. Here Henry I. was aſſaſſinated in 1038; and here alſo the emperor Charles V. and his ſiſters, were brought up till the year 1520; and formerly the aſſembly of ſtates was held here. It was firſt ſurrounded with walls in 1165, and much enlarged in the fourteenth century by Wenceſlaus and John, two dukes of Brabant. It was formerly much larger and richer than it is now, and its trade was much more extenſive. At the commencement of the fourteenth century, 4000 houſes were inhabited, by clothiers, who employed above 150,000 workmen. It is a traditionary report, that when the weavers left off work, notice was given of it by a large bell, that the children might be kept within doors, to prevent their being thrown down and trampled to death. Hence it became neceſſary to have more magiſtrates than in other cities, who aſſembled in the town-houſe, which is a beautiful Gothic ſtructure. In the year 1382 the weavers and other tradeſmen revolted againſt Wenceſlaus, duke of Brabant, and not only threw 17 of the magiſtrates out of the windows of the town-houſe, but proceeded to commit other acts of enormity, and to lay waſte the province: but being beſieged, they ſupplicated for mercy and obtained pardon, the moſt culpable only being puniſhed; and the weavers, who inſtigated the inſurrection, were baniſhed; and moſt of them retired to England, where they were well received. As Louvain, on this occaſion, was nearly deprived of commerce and inhabitants, John IV. duke of Brabant, in the year 1426, founded an univerſity, which was afterwards deemed the ornament and glory of the place, and is ſaid to have reſembled our Engliſh univerſities more than any other abroad. In this univerſity there are 60 colleges, which have been much admired for their ſituation and building, though leſs ſumptuous than thoſe of Oxford and Cambridge. Louvain had alſo a Dutch college for Roman Catholics, an Engliſh one of Dominican friars, an Iriſh one of ſecular prieſts, another of Dominican friars, and another of Franciſcans. Here was alſo a convent of Engliſh nuns, reckoned the beſt of any of this nation in the Low Countries. The trade of this place at preſent, which is much declined from what it was in the ancient days of its proſperity and glory, is not very conſiderable, and conſiſts principally in beer, of which a great quantity is ſent to Bruſſels, Antwerp, Liege, Tirlemont, and other cities and towns. Louvain is ill adapted for defence againſt an enemy, its walls being nine miles in circumference, though not a third part of the incloſed ground has buildings, the vacant ſpace being occupied for gardens and vineyards. It was taken by the ſoldiers of the French republic by Dumourier, in their haſty progreſs through Brabant, but evacuated March the 3d, 1793. Louvain was anciently ſituated partly in the dioceſe of Liege and partly in that of Cambray; but when the archbiſhopric of Malines was erected, it was placed under that dioceſe, and ſo it remained till its union with France; 21 miles S. of Antwerp. N. lat. 50° 54′. E. long. 4° 40′.

LOUVEGNE′, a town of France, in the department of the Ourthe, and chief place of a canton, in the diſtrict of Liege. The place contains 1541, and the canton 5925 inhabitants, on a territory of 170 kiliometres, in 7 communes.

LOUVET, Peter, in *Biography*, a native of Reinville, near Beauvais, flouriſhed in the ſeventeenth century, was educated to the profeſſion of the law, and became maſter of requeſts to queen Margaret. He was author of ſeveral works, which contain much uſeful and curious matter, and valuable to the hiſtorian. Of this deſcription are "The Hiſtory of the Antiquities of the Dioceſe of Beauvais;" "Nomenclatura et Chronologia Rerum Eccleſiaſticarum Diæceſis Bellovacenſis;" and "Remarks on the ancient State of the Nobility in the Beauvaſin, and of ſeveral French Families." He died in 1646.

Louvet de Couvray, John Baptist, one of the members of the French convention of France, noticed in the article Lewis XVI. He was of the Briſſotine party, and had the courage to oppoſe the ſavage Robeſpierre, when at the very height of his power; yet he eſcaped the ſlaughter which that tyrant inflicted on a multitude of good men, and died in the year 1797. He was author of a romance, entitled "The Amours of the Chevalier Faublas;" a political journal, called "The Sentinel;" "A Juſtification of Paris in 1789;" "Emily de Varmont;" and "An Account of himſelf, and of the Dangers which he had paſſed through."

LOUVIERS, in *Geography*, a town of France, and principal place of a diſtrict, in the department of the Eure, 12 miles N. of Evreux. The place contains 6500, and the canton 14,444 inhabitants, on a territory of 157½ kiliometres, in 22 communes. N. lat. 49° 3′. E. long. 2° 55′.

LOUVIGNE′-du-Désert, a town of France, in the department of the Ille and Vilaine, and chief place of a canton, in the diſtrict of Fougeres; 8 miles N.N.E. of Fougeres. The place contains 3060, and the canton 13,435 inhabitants, on a territory of 172½ kiliometres, in 8 communes.

LOUVILLE, Eugene d'Alonville, in *Biography*, a French mathematician and aſtronomer, who flouriſhed in the former part of the eighteenth century, deſcended from an ancient family, was born in the dioceſe of Chartres in the year 1671. He was educated for the naval or military profeſſion: he ſerved in both capacities, and obtained a conſiderable rank in the army of Philip V. king of Spain. Being diſbanded upon the peace of Utrecht, he devoted himſelf entirely to the ſtudy of the mathematics, and particularly to the ſcience of aſtronomy. About the year 1713 he went to Marſeilles, for the purpoſe of aſcertaining the latitude of that place, in order that he might the better compare his obſervations with thoſe of Pytheas, made almoſt two thouſand years before. In 1714 he was admitted a member of the academy of ſciences at Paris, and appointed aſtronomer at the obſervatory of that city. During the year 1715 he came into England, in order to obſerve the total eclipſe of the ſun in that year, which was to be more perfectly viſible in the neighbourhood of London, than in any other part of the northern hemiſphere. He was now elected a member of the Royal Society of London; and on his return to his native country, he applied himſelf moſt aſſiduouſly to his aſtronomical purſuits. So intent was he in proſecuting his ſtudies, that he became a recluſe, who was never to be ſpoken with but during the time when he was at his meals, and who immediately afterwards withdrew into privacy. Notwithſtanding this temper of mind, he was noted for a delicacy and niceneſs with reſpect to dreſs, and articles for the table. In the year 1732 he was attacked with a lethargic diſorder, which in a ſhort time terminated his life and labours. He was author of a great number of curious "Diſſertations," on phyſical and aſtronomical ſubjects; ſeveral of which are inſerted in the "Memoirs of the Academy of Sciences," and others in the "French Mercury." Louville was a good mechanic: he poſſeſſed a fine collection of inſtruments, the beſt of which were made with his own hands. Moreri.

LOUVO, in *Geography*, a town of Siam, ſeated on a river which runs into the Mecon. The ſituation is ſo delightful, and the air ſo ſalubrious, that the king reſides here during the greateſt part of the year; 40 miles S. of Siam. N. lat. 14° 55′. E. long. 100° 30′.

LOUVRE, in *Muſic*, a well-known dance-tune.

Louvre was alſo formerly the name of the royal palace at Paris.

Louvre, *Honours of the*. See Honours.

LOUVRES, in *Geography*, a town of France, in the department of the Seine and Oiſe; 12 miles N. of Paris. N. lat. 49° 3′. E. long. 2° 35′.

LOW, Edward, in *Biography*, organiſt of Chriſt-church college, Oxford, in the ſeventeenth century. Anthony Wood ſpeaks of him as "a proud man, who could not endure that any one of the waits or common muſicians ſhould be allowed to play at the weekly muſic-meetings, among regular profeſſors and gentlemen performers." Low had been brought up in Saliſbury cathedral, and was appointed organiſt of Chriſt-church, Oxford, in 1630, where he was deputy muſic profeſſor under Dr. Wilſon; and upon his quitting the univerſity, Low was appointed his ſucceſſor in the profeſſorſhip.

Low publiſhed, in 1661, an uſeful little book of "Short Directions for the Performance of the Cathedral Service;" which was reprinted in 1664, under the title of "A Review of ſome ſhort Directions, formerly printed, for the Performance of Cathedral Service, with many uſeful Additions according to the Common Prayer-book, as it is now eſtabliſhed: publiſhed for the information of ſuch as are ignorant in the Performance of that Service, and ſhall be called to officiate in Cathedral or Collegiate Churches; or any other that religiouſly deſire to beare a Part in that Service, by E. L., Oxon. 1664." Nothing of this kind had appeared ſince Marbeck's book, in the time of Edward VI.; and as it is now (1804) 140 years ſince the ſecond edition of Low's little tract was publiſhed, it ſeems high time for another to be drawn up by ſome regular bred and able organiſt, or choral performer, in one of the choirs of the metropolis.

Low, at the Reſtoration, was appointed one of the organiſts of the chapel royal. He died in 1682, and was ſucceeded in the king's chapel by Henry Purcell.

Low, Thomas, a ſtage ſinger, with an exquiſite tenor voice. His firſt profeſſion was that of a gold and ſilver-lace manufacturer; and he began muſic too late to read it as a language, ſo that he learned the ſongs, which he performed in public, by his ear to the end of his life. He ſtood, however, very high in the favour of lovers of Engliſh ballads, particularly thoſe of Dr. Arne at Drury-lane and Vauxhall, compoſed expreſsly for his voice and bounded abilities. He was the rival of Beard, and gained as much applauſe by the ſweetneſs of his voice, through all his ignorance, as Beard, a regular bred muſician, brought up in the king's chapel, could do by knowledge of muſic, humour, and good acting.

We wiſh not "to draw his frailties from their dread abode;" but we cannot help recording, as a beacon to other popular ſingers, that Low was profligate, extravagant, and unprincipled; which rendered the latter part of his life diſgraceful and wretched. From acquiring unbounded applauſe, and an income of more than 1000*l.* a-year, he was reduced to the loweſt ſtate of indigence, and degraded into a chorus ſinger at Sadler's Wells, Cuper's Gardens, and even a ballad-ſinger in the ſtreets.

Low *Airs*, in *Horſemanſhip*. See Airs.

Low-*Bell*, in *Birding*, a name given to a bell, by means of which they take birds in the night in open champaign countries, and among ſtubble in October. The method is to go out about nine o'clock in a ſtill evening, when the air is mild, and the moon does not ſhine.

The low-bell is to be of a deep and hollow ſound, and of ſuch a ſize, that a man may conveniently carry it in one hand. The perſon who carries it is to make it toll all the way he goes, as nearly as may be, in that manner in which the bell on the neck of a ſheep tolls, as it goes on while it feeds. There muſt alſo be a box made like a large lanthorn, about a foot ſquare, and lined with tin, but with one ſide open. Two or three great lights are to be ſet in this, and the box is to be fixed to the perſon's breaſt, with the open ſide forwards, ſo that the light may be caſt forward to a great diſtance; it will ſpread as it goes out of the box, and will diſtinctly ſhew the perſon who carries it whatever there is in a large ſpace of ground which it extends over, and conſequently all the birds that rooſt upon the ground. Two perſons muſt follow him who carries the box and bell, one on each ſide, ſo as not to be within the reach of the light to ſhew themſelves. Each of theſe is to have a hand-net of about three or four feet ſquare, faſtened to a long ſtick or pole; and on which ever ſide any bird is ſeen at rooſt, the perſon who is neareſt is to lay his net over it, and take it with as little noiſe as poſſible. When the net is over the bird, the perſon who laid it is not to be in a hurry to take the bird, but muſt ſtay till he who carries the light is got beyond it, that the motions may not be diſcovered. The blaze of the light, and the noiſe of the bell, terrify and amaze the birds in ſuch a manner, that they remain ſtill to be taken; but the people who are about the work muſt keep the ſtricteſt quiet and ſtillneſs that may be.

Some people are fond of going on this ſcheme alone. The perſon then fixes the light-box to his breaſt, and carries the bell in one hand, and the net in the other; the net, in this caſe, may be ſomewhat ſmaller, and the handle ſhorter. When more than one are out at a time, it is always proper to carry a gun. It is no uncommon thing to eſpy a hare when on this expedition; and, in that caſe, it is better to ſhoot her, than to truſt to the taking her in the net, for ſhe will very eaſily eſcape from that.

Some tie their bell to their girdle, and carry the light in their left hand, and the net in their right; the light is not to be ſo large in this caſe, and the other way is therefore rather the better.

Low-*Bellers*, in our *Statute-Books*, are perſons who go in the night-time with a light and bell, by the ſight and noiſe whereof, birds ſitting on the ground become ſtupefied, and ſo are covered with a net, and taken.

Low *Countries*, in *Geography*. See Brabant, Flanders, and Netherlands.

Low *Countries*, *School of Engraving of the*. It has been deemed eligible to adopt the uſual claſſification, and follow the examples of the continental writers upon art, in arranging our ſchools of engraving. Thoſe writers have thought proper to unite the ſchools of Holland and of Flanders under the general head of "l'Ecole des Pays bas;" and as our Cyclopædia had advanced beyond the letter D, before it was determined to cluſter our biographical notices of the profeſſors of this art, in ſchools and in chronologic ſucceſſion, it is preſumed the expediency of this arrangement will need no further argument in its recommendation, or reaſon for its adoption.

The literati and connoiſſeurs of the Low Countries have not been inſenſible to the anxieties which uſually attend on the patriotiſm of art and ſcholarſhip, and have taken ſome ſmall part in the controverſy reſpecting the invention of letter-preſs engraving and printing: but the feeble pretenſions of Laurence Coſter of Haerlem to this fancied honour, though once ſtrenuouſly aſſerted by Meerman, by Bokhorn, and by Junius, have been patiently reſigned, and gradually withdrawn; and the ſtory of his wandering in a wood near Haerlem, and printing from the bark of trees, refuted by the baron Heïnneken, is no longer liſtened to with the ſmalleſt degree of credit, beyond the ſuburbs of the good city of Haerlem.

But the Low Countries may claim the more worthy rivalry, and the more ſolid diſtinction, of having given birth to ſome of the moſt juſtly celebrated engravers on copper: and the preſcience and diſplay of ſuperior and original ſkill, are ſurely a more noble ground of conteſt, than the fortuitous concurrence of caſual diſcovery, however important in its conſequences.

We have already mentioned the Gothic engraving of the Holy Virgin, which is in the royal collection, and other prints, that with the moſt ſhow of reaſon have been preſumed to be the work of Coster (ſee that article); but if that artiſt, or that perſon rather, died in the year 1441, as is reported, how happens it that we hear ſo little more of letter-preſs engraving in the Low Countries till the time of Van Aſſen and Peter Coeck, who were neither of them born till toward the cloſe of the fifteenth century?

A rude print, deſigned in a ſtiff and Gothic ſtyle, and executed in a barbarous taſte, was ſome years ago preſerved in the library of the king of France. It had formerly belonged to the celebrated abbé Marolles; was believed by the connoiſſeurs of Paris (perhaps with reaſon) to be the moſt ancient of the Flemiſh productions in this art; and is inſcribed, in the old black letter, "Gheprint t'Antwerpen by my Phillery, de Figur Snyder," *i. e.* in Engliſh, "Printed at Antwerp by me, Phillery, engraver of figures."

The ſubject of this ancient engraving, which appears to be executed on wood, is a female figure ſitting with a dog on her lap, near whom are two ſoldiers ſtanding: but if it has been inferred to be the firſt, merely becauſe it is among the very rudeſt and worſt of Flemiſh productions, we can by no means acquieſce in the juſtneſs of ſuch a criterion; and of Mynheer Phillery, the figur ſnyder and printer, nothing further is known.

If we except the doubtful claims of Phillery, Lucas Jacobs of Leyden, Peter Coeck of Aloſt, and John Walther of Aſſen, who were contemporaneous, were the earlieſt engravers of the Low Countries with whoſe names and works we are acquainted. The former is believed to have introduced into his country the art of engraving on copper, and the method of printing with the rolling-preſs; and the two latter, that of engraving on wood, or ſo as to deliver impreſſions from the ſurface of the work, and with the letter-preſs; and all, though not the proclaimed and perſonal diſciples, were evidently the ſtudents and imitators, of Wolgemuth, Schoen, and Durer. The internal evidence ariſing from comparing their ſtyles of art, with thoſe of the early German maſters, is at leaſt as ſatisfactory a proof of ſuch a fact, as could have been derived from the teſtimony of contemporary writers: for mere writers upon art, partly from want of practical knowledge, and partly from the miſtakes of inadvertency, have not unfrequently recorded errors; which errors ſometimes continue for ages to be repeated, and to flow on through the uſual literary channels, until they are detected and dragged aſhore by the local knowledge and power of profeſſional artiſts, or the cultivated eye and matured judgment of unaffected connoiſſeurſhip.

On comparing dates, it appears that the birth of Jacobs was four years poſterior to thoſe of Coeck and Walther, though he preceded them in the practice of engraving.

Peter Coeck, or Koeck, was born in the year 1490, at Aloſt, in Flanders, and died in the ſame city A.D. 1550. From Barent Van Orley, of Bruſſels, he obtained ſome inſtructions in drawing, after which he travelled to Italy for improvement, where he made very conſiderable progreſs in his ſtudies, and from whence he made a voyage to Turkey.

On his return he married, and ſettled in his native town, where he enjoyed a ſmall penſion from the government; but his wife dying ſoon after, he removed to Bruſſels, and engaged to paint for a company of merchants, who had conceived the project of eſtabliſhing a manufacture of tapeſtry at Conſtantinople under his direction.

During his reſidence abroad, he had made drawings of that magnificent city and its ſuburbs; which, on the failure of the tapeſtry ſcheme, he cut on ſeven wooden blocks, divided into as many compartments, which being joined together, make a very large, long print, reſembling a frieze. On a tablet belonging to the firſt block is written in bad French, "The Manners and Cuſtoms of the Turks, with the Countries belonging to them, drawn from Nature by Peter Coeck of Aloſt, when he was in Turkey, in the year of Jeſus Chriſt MDXXXIII. He alſo with his own hand executed theſe prints according to the drawings he had made." And upon a tablet in the laſt block, in the ſame language is inſcribed, "Mary Verhulſt, widow of the ſaid Peter d'Aloſt, who died in the yeer 1550, cauſed theſe figures to be printed under the grace and privilege of his imperial majeſty, in the year MCCCCCLIII." The principal ſubjects of theſe blocks are, 1. The March of the Grand Seignior with his Janiſaries. 2. The Suite of the Grand Seignior walking. 3. A Turkiſh Marriage, with the Ornaments and Dances of the Country. 4. Their Funeral Ceremonies. 5. Their Rejoicings on the New Moon. 6. Their Repaſts. 7. Their ſeafaring and warlike Cuſtoms.

After Coeck returned to his native country, he married a ſecond time, Mary Verhulſt, and had a daughter, who afterwards married his pupil, Peter Breughel the elder. Beſides many altar and cabinet pictures, executed by Coeck, he tranſlated from the Italian the works of Sebaſtian Serlio, and Vitruvius; contributed greatly to the improvement of the architecture of his country; and was honoured with the title of firſt painter to the emperor Charles V.

Strutt ſays of his engravings, that they contain a vaſt number of figures, executed with great care, but not much taſte: but that they are very curious, and were doubtleſs very eſtimable at the time they were performed. He uſually marked them with his initials in the form of a monogram, which will be found in our *Plate* I. of thoſe uſed by the engravers of the Netherlands.

John Walther Van Aſſen was alſo born in the year 1490, and in his youth flouriſhed at Amſterdam, but the events of his life are very obſcure. He engraved on wood with a degree of boldneſs ſuperior to that of the age in which he lived: his invention was copious; and the heads of his figures often expreſſive. His print of "Chriſt praying in the Garden" has been particularly admired, and very juſtly ſo, when regarded with reference to the time and place in which he lived: but the forms of his naked, as might be expected, are Gothic, meagre, and ill drawn.

Walther commonly marked his engravings with his initials, combined in a cypher, and as if inſcribed on a tablet, as may be ſeen in our firſt plate of the monograms, &c. uſed by the engravers of the Low Countries; and the beſt liſt which we are able to form of his works is as follows.

A ſet of ſix, of the circular form, about nine inches in diameter, from the Life and Paſſion of Chriſt. They are dated in the years 1513 and 1514; marked with the cypher of the artiſt; and each print is ſurrounded with a ſort of Dutch groteſque ornament. Their ſubjects are, "The Scourging of Chriſt;" "Our Saviour at Prayer in the Garden of Olives," wherein his three diſciples are repreſented aſleep, and the Jews are advancing, conducted by Judas; (this is the print diſtinguiſhed above for its ſuperior merits;) "Chriſt taken into Cuſtody, with St. Peter cutting off the Ear of the Servant of Malchus;" "Chriſt bearing his Croſs," with the proceſſion to mount Calvary; "The Crucifixion," in which St. John and the holy women are introduced at the foot of the croſs; and "Jeſus laid in the Sepulchre," attended by Joſeph of Arimathea bearing a vaſe of ointment.

Another ſet of ſeven plates in folio, each conſiſting of ſix different ſubjects contained in architectural compartments, with deſcriptions in the Dutch language. The ſubjects are partly hiſtorical and partly allegóric ; ſome are from the Chriſtian, and others from the heathen mythology ; and it would be difficult, if it be practicable, to connect the whole on principle. The ſeventh print is inſcribed " Gheprint tot Aemſtelredam, by Doen Pieter toon in Enghelenburch," and all are marked with the monogram of the artiſt.

Beſide theſe, are ſome proceſſions, of which we know not the titles or number, from the graver of Walther of Aſſen, and a ſmall upright print of an armed figure on horſeback, with the enſign of the caſtle of St. Angelo, inſcribed " St. Hadrianum. Amſtelodamus in Ædibus Donardi Petri ad ſigne Caſtri Angelica." The whole are after his own compoſitions.

Lucas Jacobs of Leyden, the earlieſt engraver on copper that the Low Countries produced, was an honour to his age and country. His country appears to have thought ſo, and hence in ſome parts of Europe his family name is nearly loſt, and he is univerſally known by the appellation of Lucas van Leyden.

Lucas was born in the year 1494, and was the ſon of Hugues Jacobs, a painter, but not of much talent or reputation, and whoſe chief glory has been reflected from the brightneſs of his ſon's abilities. Obtaining a rudimental acquaintance with art under his paternal roof, Lucas began, even during the age of adoleſcence, to diſtinguiſh himſelf by his drawings and his extraordinary attempts in the arts of painting and engraving. He finiſhed his elementary ſtudies in the ſchool of Cornelius Engelbrecht, who was then in the height of reputation. But perhaps his greateſt happineſs as an artiſt, conſiſted in his living at the ſame period with Albert Durer, between whom and himſelf the moſt intimate and ſincere friendſhip, and the utmoſt freedom and liberality of profeſſional communication, ſubſiſted : for Durer, who was the ſenior of our artiſt by more than twenty years, on ſeeing ſome of his youthful productions, is ſaid to have conceived for him the moſt lively eſteem, which gave birth to a correſpondence, generous and diſintereſted at firſt on the part of the German, and which by degrees grew familiar and friendly on both ſides. The biographers of Lucas have reported, that between the age of nine years and twelve, he executed a print of St. Hubert, for which he was rewarded by a certain burgomaſter with as many guilders as he was years of age. The preſent writer has not ſeen this juvenile production, nor has he found it mentioned in thoſe foreign catalogues which he has conſulted of the works of our artiſt. He therefore preſumes it may have been a copy, done for practice and improvement in the new art, of the juſtly celebrated work of Albert Durer, which is thus entitled, and that it was probably among thoſe early and ſurprizing productions which called forth the favourable notice of the artiſt of Nuremberg, and became the baſis of the ſubſequent intimacy between Albert and Lucas, which ended but with the life of the former.

Each of theſe diſtinguiſhed artiſts regularly ſent as preſents to his friend, ſelected impreſſions (for the mercantile trickeries of proof-taking and proof-making had not then been invented) of every engraving which he publiſhed ; and when Durer was driven from Nuremberg by the ill-temper of his wife, he ſought refuge at Leyden, was received by Jacobs in the moſt cordial and affectionate manner, and to commemorate their mutual friendſhip, beſides painting each other's portraits, they executed a picture in conjunction on the ſame pannel.

It ſhould have been mentioned before, that Lucas acquired his knowledge of the uſe of the graver in the workſhop of a goldſmith of Leyden, and that of the proceſs of etching, he obtained from an armourer of that city, who employed the corroſive power of aquafortis in ornamenting cuiraſſes, and other conſpicuous parts of plate armour. The preſent writer has, in another work, ſtated his conjecture, that the ancient corroded ſword-blades of Syria and Damaſcus are the probable origin of the art of etching on copper, and now ſuſpects that he may have been miſtaken in attributing (as he has done under the article ETCHING) its invention to Albert Durer. He now thinks it not improbable that Lucas imparted this art of corroſion to his friend, either by letter, or, he ſhould fancy, during the reſidence of the latter at Leyden, if there were not grounds for ſuppoſing that this journey was not undertaken until after the year 1516, when Durer's firſt etching (of which the ſubject is the rape of Proſerpine) was produced. And he thinks ſo the rather from reflecting on the generally received report, that the two earlieſt of Albert's etchings were performed on plates of iron or ſteel : yet Lucas's etching of St. Catherine, which is believed to be his firſt production in this art, did not appear until the year 1520.

Lucas of Leyden was frank, generous, and urbane, as well by nature as by habit ; yet his generoſity in ſome inſtances was requited with ingratitude ; and his urbanity, if we might credit the tale which is related below, did not ſhield him from the ſhafts of envy and malevolence. Conſpicuous by his rare and ſingular endowments, and unremitting in his habits of profeſſional induſtry, the novelty, beauty, and number of his publications could ſcarcely fail to enrich him. Strutt ſays " he gained much money by his profeſſion, and being of a generous turn of mind, had not the leaſt notion of ſhutting up his money in his cheſt ; on the contrary, he ſpent it freely, dreſſed well, and lived in a ſuperior ſtyle."

To enjoy his popularity, or improve his taſte, he made a journey into Zealand and Brabant, at the age of thirty-three, giving entertainments to the artiſts in moſt of the great towns and cities through which he paſſed ; and it is reported, that during this journey, a ſlow poiſon, which was fatal to our artiſt, was adminiſtered to him at one of theſe entertainments by a painter of Fluſhing, who was envious of the fame which followed the exerciſe of his various talents. But the honour of human nature ſhould perhaps incline us not to liſten too readily to ſtories of this kind. No delicacy ſhould have led, and no pardon was likely to lead, to the repreſſion of the name of the author of a deed ſo atrocious. Yet he was never pointed out : and it muſt be a ſlow poiſon indeed! that is ſix years in effecting its purpoſe.

It ſeems more worthy of belief that the real poiſon of Lucas van Leyden, conſiſted of a mixture of the occaſional exceſſes of convivial indulgence, with habits of intenſe profeſſional application. Contrarieties which can never aſſimilate, few conſtitutions can endure ; and ſo anxious and unremitting was the application of Lucas, that he found the day too ſhort for his purpoſe, and frequently conſumed great part of the night alſo in his ſtudies.

Even during the laſt ſix years of his life, while he lay pining under the preſſure of diſeaſe, or at leaſt oppreſſed by a ſickneſs under which ordinary minds would have languiſhed, his induſtry and love of art were eminently conſpicuous. When it was repreſented to him that ſuch cloſe attention did but increaſe the malignity of his diſorder, he calmly replied, " I am content it ſhould be ſo, ſince, by my ſtudies, I endeavour to make my bed of ſickneſs a bed of honour. An artiſt can never die in a more ſuitable manner than with his pencil in his hand."

He died accordingly at the age of thirty-nine in his native city, and in the year of our Lord 1553.

Beſide engraving both on copper and on wood, Lucas painted in oil, in diſtemper, and upon glaſs, exerciſing the latter art by a proceſs that is known to few if any of its modern practitioners. He commonly marked his works with the ſort of Gothic L, which will be found in our firſt plate of the monograms, &c. of the engravers of the Low Countries, ſometimes adding the date of the year, and inſcribing both on a tablet.

Vaſari ſays, that "perhaps Lucas equals any of the beſt artiſts in the management of the graver; that his hiſtorical ſubjects are executed with great truth, and that he knew well how to group his figures without creating confuſion in his prints;" but is certainly too loud in his praiſe, where he adds, that "he ſurpaſſed Durer in compoſition, and ſucceeded in repreſenting aerial perſpective with the graver, as well as could have been done with the aſſiſtance of colour."

A juſter eſtimate of his merits may be found in the biographical dictionary of our countryman Strutt, who affirms that his ſtyle of engraving differed conſiderably from that of Albert Durer, and ſeems evidently to have been founded upon the works of Iſrael van Mecheln. His prints are very neat and clear, but without any powerful effect. The ſtrokes are as fine and as delicate upon the objects in the front, as upon thoſe in the diſtances; and this want of variety, joined with the feebleneſs of the maſſes of ſhadow, give his engravings, with all their neatneſs, an unfiniſhed appearance, much unlike the firm, ſubſtantial effect, which we find in the works of Albert Durer. He was attentive to the minutiæ of his art. Every thing is carefully made out in his prints, and no part of them is neglected. His figures are generally tall and thin; the attitudes well choſen, and frequently graceful and elegant. In theſe he followed nature ſimply, without affectation. He gave great character and expreſſion to the heads of his figures; but on examination of his works, we find the ſame heads too often repeated. The hands and feet rather mannered than correct; and when he attempted to draw the naked figure, he ſucceeded but indifferently. He affected to make the folds of his draperies long and flowing; but his female figures are frequently ſo exceſſively loaded with girdles, bandages, and other ornamental trappings, that much of the elegance of the deſign is loſt; and that native ſimplicity, which is, as it were, the very ſoul of painting, is deſtroyed.

To Adam Bartſch of the Imperial library at Vienna, the public is indebted for a catalogue raiſonnê of nearly two hundred of the engravings of this maſter, all of which are the produce of his own fertile invention. About twenty woodcuts have alſo been aſcribed to him, but of which he was probably only the deſigner. Mariette, however, poſſeſſed two hundred and thirty of his prints.

As nothing like an Engliſh catalogue has yet appeared, we ſhall name as many as we are able, beginning with thoſe ſubjects which he has taken

From the Old Teſtament.—"The Hiſtory of the Creation, and the Fall of our firit Parents," in a ſet of ſix fine prints of ſmall folio ſize, engraven A.D. 1529; of which the ſubare, 1. God, (repreſented by the figure of an old man,) creating Eve during the Sleep of Adam. 2. God laying the Injunction on Adam and Eve not to touch the forbidden Fruit. 3. Eve, ſeduced by the Serpent, perſuading Adam to eat of the Fruit of the Tree of Life. 4. Adam and Eve expelled from Paradiſe. 5. Cain ſlaying Abel. 6. Adam and Eve deploring the Death of Abel, who is extended before them. "Adam and Eve, Fugitives, after being turned out of the terreſtrial Paradiſe," in 4to. ſize. Lucas has treated "The Treſpaſs of Eve," and "The Death of Abel," in a different manner, on ſix ſmall plates; "Lamech ſtanding, bending his Bow, and Abel ſitting at the Foot of a Tree, with the Jaw-bone of an Aſs before him," in 8vo.; "Abraham and the three Angels," of quarto ſize; "Lot and his Daughters eſcaping from the burning City," a very fine engraving, dated 1530, companion to "The Sin of Adam and Eve," in ſmall folio; "Abraham ſending away Hagar and Iſhmael," a middling-ſized plate, lengthways, dated 1510; and known among dealers by the name of the large Hagar. The ſame ſubject otherwiſe treated, called the little Hagar, of 4to. ſize, dated 1516. The Hiſtory of Joſeph, in five 4to. prints, dated 1512; and of which the ſubjects are, 1. Joſeph recounting his Dreams to his Brethren. 2. Joſeph ſolicited by the Wife of Potiphar. 3. The Wife of Potiphar accuſing Joſeph. 4. Joſeph in Priſon, explaining the Dreams of the Officers. 5. Joſeph interpreting the Dreams before Pharoah. "The Daughter of Jephtha meeting her Father," one of the earlieſt productions of Lucas, engraved ſome time about the year 1508; "Dalila cutting off Sampſon's Hair," "David and Goliah," and "David playing the Harp before Saul," all in folio; "David ſupplicating in behalf of his People," a large print. The ſame ſubject differently treated, an etching, dated in 1520. "Solomon worſhipping the Idols," in quarto; "Eſther before king Ahaſuerus," a large folio plate; the proof of which, in the royal collection at Paris, coſt two hundred and fifteen livres, according to the note of P. Mariette written at the back of the print. "Suſannah and the Elders," of 4to. ſize, dated 1508.

Subjects from the New Teſtament.—"St. Joachim embracing St. Anne," dated 1520; "The Annunciation," "The Viſitation," both of octavo ſize; "The Adoration of the Magi:" this is eſteemed one of the moſt conſiderable works of the maſter, it is dated 15 3; and of large folio ſize. "The Repoſe during the Flight into Egypt;" "Jeſus baptized in the River Jordan," a very grand compoſition, containing a very numerous aſſemblage of figures, and engraved about the year 1510; "Jeſus tempted by Satan in the Deſart," dated 1518, all of quarto ſize; "The Reſurrection of Lazarus," a grand compoſition, engraved in the year 1508, folio ſize; "The Paſſion of our Saviour," repreſented in fourteen plates, engraved A.D. 1521, and entitled as follows, *viz.* 1. The Laſt Supper. 2. Jeſus on the Mount of Olives. 3. Our Saviour ſeized in the Garden of Olives. 4. Our Saviour taken before the High Prieſt. 5. Jeſus reviled. 6. The Flagellation. 7. Jeſus crowned with Thorns. 8. Jeſus expoſed to the People. 9. Chriſt bearing the Croſs. 10. The Crucifixion. 11. The Deſcent from the Croſs. 12. Our Saviour laid in the Sepulchre. 13. The Deſcent into Hell. 14. The Reſuſcitation. Another ſet of "The Paſſion of our Saviour," in nine circular plates, eight inches in diameter. A grand "Ecce Homo," very rich in compoſition, containing more than a hundred figures, one of the beſt engravings of Lucas, dated 1510, in large folio. "Jeſus Chriſt on the Croſs, between the two Thieves," a very fine print, nearly as rich in compoſition as the preceding, having twenty-four figures admirably grouped: the good impreſſions of this plate are very ſeldom to be met with, it is dated 1517, and in large folio. "Our Saviour appearing to Mary Magdalen as a Gardener," both half figures, placed before the ſepulchre, in 4to. and dated 1519; "The Return of the Prodigal Son," a folio print, admirable for the ſpirited execution of the back-ground and ſmall figures, engraved A.D. 1510.

Various Devotional Subjects.—"The Virgin and Child, accompanied by St. Anne," dated 1516; "The Virgin and Child, ſtanding on a Biſhop's Crozier;" "The Virgin and Infant Jeſus," 1514; "A Holy Family," in quarto; "The Virgin and Holy Infant, contemplated by two Angels," in quarto. Jeſus Chriſt and his twelve apoſtles, in a ſet of fourteen plates, of octavo ſize. The four Evangeliſts, occupied in writing the goſpel, half-length figures, in 8vo. St. Peter and St. Paul, half-length figures, octavo ſize. Another plate of the ſaints "Peter and Paul," in a landſcape; a very fine engraving, dated 1527. "The Converſion of St. Paul," a very grand compoſition, in large folio, dated 1509. "Saint Chriſtopher," in which he appears ſitting at the foot of a rock, on the banks of a river: on one ſide of the ſaint, in the back-ground, is a hermit, coming out of his cell with a lantern. This print is one of the earlieſt productions of Lucas, done apparently about the year 1508, of octavo ſize. "Saint Chriſtopher in the Water, with the Infant Chriſt on his Shoulders," a ſmall print.

Albert Durer engraved and publiſhed the ſame ſubject in the courſe of the ſame year, and it is ſuppoſed the two artiſts worked in concurrence. "St. John the Baptiſt," dated 1513, "The Decollation of St. John the Baptiſt," both in octavo; "St. Jerome," the head ſurrounded with rays of glory, ſitting in an alcove, with a ſkull before him. Lucas engraved this ſubject three times; but the print which is treated in the beſt manner is dated 1521, in quarto. "St. Sebaſtian," in which the holy martyr appears faſtened to a tree, with his body pierced by arrows, in octavo, engraved probably in the year 1508; "St. Antony," habited in a long robe, with a monk's cowl on his head, and a great number of acceſſories, in octavo; "The Temptation of St. Antony," where he is repreſented ſeated on a hillock between two trees, looking at a figure, whom he perceives to be a female devil, from the horns ſticking through her head dreſs. The back-ground is a mountainous landſcape, with an old caſtle; a very fine print, dated 1509, in quarto. "St. Dominic," ſurrounded by rays of glory, holding a ſtaff, terminated by a crucifix: behind him is a dog, holding in his mouth a flaming torch, in octavo, engraved ſome time about the year 1514. "St. Gerard Sagredius," a biſhop and martyr, his head covered with an epiſcopal mitre, ſurrounded with rays of glory: he holds in his hand a heart pierced with an arrow, octavo. "St. Francis receiving the Stigmatics," from a crucifix ſuſpended in the air: at the bottom of the print is a Capuchin monk, ſitting at the foot of a tree, in octavo. "St. George liberating the Princeſs of Antioch," whom he has reſcued. In this, as in many other old prints, the action is double: in other words, two points of time are repreſented, for in the back-ground is St. George combating the dragon, and the princeſs chained againſt a rock; engraved in 1508. "Mary Magdalen entering into worldly Pleaſures," a celebrated print, of large folio ſize, known among the amateurs under the name of "The Magdalen's Dance:" in one part of the print ſhe is repreſented dancing with a man to a flute and tambourin, with various other groups: lower down ſhe is repreſented on horſeback, at the head of a troop of huntſmen; and again flying towards a wood with three men, one of whom ſounds a horn: and towards the ſummit of a rock is the ſoul of the Magdalen raviſhed in the air by four angels. This fine print was engraved about the year 1519, when the artiſt was in his meridian. "The Magdalen in a Deſert at the Foot of a Rock;" in the clouds is repreſented the eternal father with a long beard, and a tiara on his head. This is without date, but is doubtleſs one of the earlieſt productions of Lucas, while his powers of drawing and compoſition were yet feeble, and is better engraved than it is deſigned. "The Magdalen ſtanding on a Cloud, holding a Vaſe:" to this print has been miſtakenly given the appellation of "Pandora letting out the Evils of the World;" it is dated 1518, and of octavo ſize. There is in exiſtence a print of this ſubject, marked with the initials I. V. M. which has been attributed to Iſrael Von Mecheln; but, on compariſon, it appears to be a bad copy of the engraving by Lucas, by an unknown hand. "St. Catherine," a half-length figure, crowned with rays of glory, leaning on a wheel, with a book and ſword. It is an etching, touched in ſome parts with the graver, and dated 1520.

Profane Subjects.—"Mahomet ſleeping, with a Prieſt murdered by his Side, and another Figure ſtealing his Sword," a folio print, ſaid to be one of his earlieſt productions; the ſeven cardinal virtues, ſitting figures, each crowned by an angel, dated 1530, *viz.* 1. Faith. 2. Hope. 3. Charity. 4. Prudence. 5. Juſtice. 6. Fortitude. 7. Temperance. "The Death of Lucretia," dated 1512, which print is by ſome called "The Death of Dido," in octavo; "The Death of Pyramus and Thiſbe;" "The Poet Virgil, ſuſpended from a Window in a Baſket, to the Deriſion of the Populace;" a ſmall folio print, executed with great taſte and ſpirit, and very correctly drawn, and well compoſed. Vaſari, who ſpeaks very highly of this print, ſays, that "Albert Durer was ſo ſenſibly ſtruck with the merit of it, that he afterwards wiſhed to concur with Lucas in producing a pair of prints that ſhould correſpond in form, moral, and dimenſions, to which deſire we owe the celebrated print of "Death's Horſe." The two prints do correſpond in theſe reſpects: yet the inadvertency of Vaſari in this place, which has been repeated by Huber and Roſt, has not hitherto been pointed out. To make any thing credible of this ſtory, the order of the facts and perſons muſt be reverſed; for the "Death's Horſe" of Albert Durer was produced to the public in the year 1513, whereas Lucas of Leyden did not publiſh his ſuſpended poet till 1525. And what renders the non-detection of this error the more ſurpriſing and remarkable is, that both theſe engravings bear their reſpective dates; the latter on a fragment of broken ſtone at the left-hand corner of the print, the former immediately above the monogram of Albert on his uſual tablet.

The emulation muſt, therefore, have been felt by Lucas, and his engraving of "The Courtezan ſuſpending Virgil in a Baſket," which, of all his works, approaches neareſt, in point of ſtyle, to this exquiſitely finiſhed print from the graver of Durer, muſt have been produced accordingly.

The recondite moral and meaning of theſe compoſitions, and intentions of their authors, will then ſtand thus. Albert Durer had produced a juſtly admired engraving, by ſome vulgarly termed "Death's Horſe," by others "The Worldly Man," but wherein a cavalier, completely armed, ſallies forth on the buſineſs of Death. His ſteed is richly harneſſed; his helmet ſtudded and wrought with ornaments; and his armour, in the fine impreſſions, appears as if of ſilver, and of coſtly workmanſhip. He is a hero, and perhaps intended by Albert for ſome Alexander, or individual general of renown. Whilſt he is gravely bent on the purſuit of that glory which ariſes from the deſtruction of his fellow men, a crowned ſpectre, which ſeems intended for Death, croſſes the warrior's way: he is mounted on a mule, holds up an hour-glaſs with an index before the hero, and ſeems to ſcoff at his purpoſe; while a frightful monſter, with various horns, like one of thoſe mentioned in the Apocalypſe, and which is probably intended for the Devil, follows hard after him, intent and ready to ſeize on his prey. The moral has various acceſſories, ſuch as a lofty caſtle in the back-ground, and a lizard crawling in the road, whoſe allegorical office is to warn man of danger. A warning bell, too, hangs from the neck of the mule, on which rides the ſpectre, while to the capariſon of the warrior's ſteed, the jingling bell of Folly is appendant.

It is altogether a profound pictured allegory, worthy of ſerious contemplation, and dictated by the ſame muſe who afterwards prompted Dr. Young to write

> "Deaths ſtand, like Mercuries, in ev'ry way,
> And kindly point us to our journey's end."

It appears to the preſent writer, that, ſtruck with this extraordinary diſplay of the various powers, as poet, painter, and engraver, of his friend Durer, the Dutch artiſt became laudably ambitious of deſigning and executing a fit companion to a production which muſt doubtleſs have been very popular; and, accordingly, inſtitutes and ſtimulates a compariſon between the love or luſt of conqueſt and falſe glory, and that of woman, and with much ingenuity calls on the ſpectator to behold and balance their abſurd and pernicious conſequences.

A pictorial compariſon is thus provoked between the moral conſequences of the abuſe of two potent paſſions; and if it might be granted that we perceive the little diſtant figure, whom, in the print of Lucas, the courtezan ſuſpends in a baſket, and expoſes to the deriſion of the populace, to be the poet Virgil, the moral effects would be heightened by the reflection, that it is the organ of Fame, and diſpenſer of terreſtrial immortality, who is thus himſelf made to appear infamous and ridiculous, as in the print of Albert it is the deſtroyer who is the victim.

But of this it requires that the ſpectator be informed by Lucas, or by Vaſari; for as the coſtume and characters (as in all the works of this maſter) are perfectly Dutch, no other men would dream that a ſmall diſtant head, covered with the mitre of epiſcopacy, or the cap of folly, was that of the Mantuan bard.

This engraving is, however, with regard to compoſition, manual execution, high finiſh, and actions and expreſſion of the figures on the fore-ground, particularly that of the principal male figure, one of the very beſt of the works of Lucas van Leyden.

To quit this digreſſion, and reſume our liſt of the ſubjects which he has deſigned and engraved from profane hiſtory, and his own fancy. "Venus, the beautiful Goddeſs of Love," a 4to. plate, dated 1528. A folio plate of "Mars and Venus," with armour and an attendant cupid, was executed during the long illneſs of the artiſt; as was alſo "The Goddeſs Pallas," armed with her ægis and ſpear. The latter was the laſt plate which he engraved, and it is ſaid, that a ſhort time before he died, he requeſted to ſee it; upon which occaſion it ſeems probable, that he uſed thoſe remarkable words, ſo much to his honour as an artiſt, which we have cited in his biography. "A military Officer diſplaying a Flag." The attitude of the figure is very ſpirited and ſoldier-like, and the print altogether is very beautifully finiſhed; both are of octavo ſize. "Four Soldiers in a Foreſt," without a date, but probably engraven about the year 1508. A very fine print of a young man at the head of a party of ſoldiers, liſtening attentively to a man, with his hat in his hand: on each ſide is repreſented a group of three men converſing. "The Beggars," one of whom receives a platter from the other: the group is completed by a female figure, with her hand on her breaſt. This print appears to have been engraven about the year 1508. "The Promenade:" the back-ground repreſents a manſion ſituated at the foot of a mountain, which terminates the view, dated 1520. "The Earl and Lady, with a Falcon:" this is drily executed, and appears to have been engraven about the year 1508. "The Wood Nymph," ſhe is walking with a peaſant, and another figure conducting them; all of octavo ſize. [Note.—There is a copy of the Wood Nymph, engraved by Wierix at the age of twelve.] A man with a lighted torch, conducting a female, followed by a man with a ſabre, and a club acroſs his ſhoulder: this print is very delicately executed, apparently about the year 1508. A female figure preſenting a vaſe to a man; the landſcape is terminated by a mountain, the ſummit of which is crowned with an ancient caſtle, dated 1520, of octavo ſize. "The Pilgrims," conſiſting of three figures, quarto ſize; "The wedding Ring," repreſenting a man giving a ring into the hand of a young woman, ſeated by his ſide. This rare print is etched in a firm ſtyle, dated in 1520, and diſtinguiſhed by the neatneſs of the execution, in quarto. "The Fool," repreſenting a female figure, defending herſelf from the embraces of a fool, characteriſed by his dreſs and baubles, both half-length figures. This is an etching, ſlightly touched with the graver, and dated 1520. "The old Man with a Bunch of Grapes," a half-length profile. This print is admirably touched, and appears to have been done about the year 1523, when the artiſt was in his meridian. "The young Trumpeter," repreſenting a boy blowing a trumpet, to the ſound of which two others are dancing; one of the earlieſt productions of Lucas. "The Woman and the Bitch," repreſenting a female with her head enveloped with drapery, the ends of which hang in folds over her body; towards the left are perceived the head and foot of a bitch, whom the lady is feeding with fruit. This print is executed on a white ground, and dated 1509. Another "Woman and Dog," dated 1510; "The Muſicians," a very fine print, dated 1524, conſiſting of a man playing a guitar, and a woman playing a violin; "The Surgeon," performing an operation behind the ear of a peaſant, whoſe countenance tells us plainly how much he ſuffers, dated the ſame as the preceding; "The quack Doctor," operating with an inſtrument in the mouth of a peaſant, who with great vexation perceives that, during the operation, a girl behind him is emptying his purſe of its contents. This print poſſeſſes equal merit with the two former, and is dated 1523; all of octavo dimenſions. "The Milkmaid," holding in one hand her bonnet, and in the other a pail, into which ſhe is about to milk a cow held by a peaſant. This is a very rare print, dated 1510, of quarto ſize. "Uylenſpiegel," or "L'Eſpiegle," the ſcarceſt of all the works of this maſter. It was in the collection of the king of France, and miſtakenly ſaid by Marolles, and other French connoiſſeurs, to be unique. Baſſan informs us, that M. Mariette had alſo an impreſſion of this plate, and ſeveral are known to exiſt in England. It repreſents a man playing upon the bag-pipes, carrying two children in a baſket, and a woman with an infant in her arms. It is nearly ſeven inches and a half high, by four inches and three quarters wide; and has been copied of the ſame ſize ſeveral times. One of the copies is by Hondius; but the beſt has no name to it. This rare print is dated 1520.

Various Ornaments.—The profile of a warrior's head in a medallion, ſurrounded with ornaments. It is dated 1527, and marked with the letter L, on a cartouche at the bottom. A compoſition of ornaments in the taſte of that age, compoſed of a ram's ſkull and two fiſh, dated 1527. Another compoſition of ornaments, with a Mercury ſitting between two ſphinxes, folio ſize, dated 1528. A pannel of ornaments, compoſed of a marine deity with a trident, ſurrounded by ſirens and chimeræ, executed on a black ground, in octavo, and dated 1528. "The Infant Warriors," one of whom diſplays a flag, and the other carries a helmet; and "The Arms of the City of Leyden," in a ſmall circle, ſurrounded by four others, each containing a genius, engraved ſome time about the year 1510, both of octavo ſize.

Portraits.—The emperor Maximilian I. with his hair plaited and wearing a large hat. Lucas painted the portrait when the emperor viſited Leyden, but did not engrave it till the year 1520, after the death of that prince. The head is entirely engraved, and the remainder etched, and ſlightly touched with the graver to give it effect; in the back-ground is a little figure holding a ſcroll, marked with the letter L. This is the fineſt portrait Lucas ever engraved; very rare, and of folio ſize. A portrait of the artiſt himſelf, repreſented with a hat on, and a mohair doublet trimmed with fur. This portrait was drawn and etched by himſelf when he was but twenty years of age; it is touched in a light ſpirited manner, and inſcribed, "Effigies Lucæ Leidenſis propria manu inciſa," of quarto ſize. Portrait of a young man, half length, dreſſed in a cap and feathers, and pointing to a ſkull which he holds under his robe. This portrait commonly paſſes for that of Lucas himſelf, but it is very unlike the former. Lucas is always repreſented with ſhort plaited hair, and this portrait has very long and curly hair; it is of quarto ſize, and engraved apparently about the year 1525. There is a print attributed to Lucas, of which the ſubject is "A Family ſurpriſed by Death," but it is too poorly executed to be really his performance; for in the year 1529, the period when this print was engraven, our artiſt was in his meridian. The drawing of it is the beſt part, but there is great want of ſpirit and correctneſs in the contours.

Martin Van Veen was born at the village of Hemſkirk, in Holland, in the year 1498, and till he was eclipſed in the public notice, by the celebrated painter of that name, was called after his native village. He learned the rudiments of drawing from John Lucas, and of painting from John Schoreel, but of the ſubſequent progreſs of his ſtudies, there are two accounts of an oppoſite nature. Strutt ſays, that "his early application was attended with little ſucceſs, and his genius was clouded by an appearance of natural dulneſs, which ſeemed to preclude all hope of his ever attaining to any reaſonable degree of perfection." Huber, on the contrary, after ſeeing Strutt's biography of this artiſt, ſays, that he imitated the ſtyle of his maſter Schoreel ſo well, that he became jealous of the riſing talents of Van Veen, and expelled him from his ſchool; from which it is clear, that if the ſcholar was not a blockhead, the maſter was illiberal.

Van Veen, however, has obtained praiſe from Mariette, and from Girard Laireſſe, and the eaſe and accuracy of his drawing, and firmneſs of his contours, have been repeatedly commended. After quitting the ſchool of Schoreel, the fame of Michael Angelo, and the antique ſculpture, attracted him to Italy, but after ſtudying there for ſome time, he returned to Holland and ſettled at Haerlem, where he died in the year 1574.

Neither the engravings nor paintings of Van Veen would now be much admired, being deficient in grace, expreſſion, and harmony of chiaroſcuro, but among his contemporaries his works commanded reſpectful attention. They may be known by the monogram which the reader will find in *Plate* I. of thoſe uſed by the engravers of the Low Countries.

Among his beſt prints are "Judah and Tamar," and "The Annunciation," both in 4to.; "Commercial Induſtry," in folio, and "The Wiſe and Fooliſh Virgins," nearly of the ſame dimenſions. The twelve plates of the battles of Charles V., which have been attributed to him, are from the graver of Theodore Coornhaert, but were executed after his deſigns.

Dietrich, or Theodore Vander Staren, or Von Stern, was born in Holland, ſome time about the year 1500; the time of his death has not been recorded, but it is known that he continued to engrave till 1550. He is ranked by the French in the claſs of little maſters, and known by the appellation of the Maſter of the Star, becauſe in his monogram he uſed to place a ſtar between his initials, as ſeen in our firſt plate of thoſe uſed by the engravers of the Low Countries. His compoſitions prove him to have been a man of talent: he has engraven many landſcapes and ſubjects from ſacred hiſtory, after his own deſigns. He underſtood the human figure tolerably well, but his proportions, like thoſe of the Dutch people, are ſhort and heavy; and he often crowded his back-grounds with architectural ornaments. To his monogram he uſually added the day of the month on which his plates were publiſhed.

The following are engraved by Vander Staren from his own deſigns. "The Miraculous Draught of Fiſhes," dated 1523, in octavo; "Chriſt walking on the Sea," a ſmall upright; "The Temptation of Chriſt," where the Devil is repreſented with pointed ſhoes; a ſmall upright plate. A very ſmall plate of a ſaint kneeling before the Virgin, who holds the infant Chriſt, dated 1524; "St. Luke painting the Virgin and Child," dated 1526, of octavo ſize. A folio plate of "The Deluge;" marked D. Van Stern. ſec. 1523: and "The Good Samaritan," engraved A.D. 1525, in octavo.

Of Francis Babylone, better known by the appellation of the Maſter of the Caduceus, we have various accounts, and all of them involved in more or leſs of uncertainty. He was probably born ſome time about the commencement of the ſixteenth century, and, according to Roſt and Huber, at Leyden: he is ſuppoſed to have ſtudied in Italy under Marc Antonio, or Gregory Peins. The time of his deceaſe is entirely unknown.

As he neither affixed name, date, nor initials to his very ſingular prints, but ſimply the ſmall caduceus which will be found in our firſt plate of the monograms, &c. uſed by the engravers of the Low Countries, his very name is ſcarcely ſettled, and he has been by ſome writers called Iſrael Martin, and affirmed to have been the tutor of Albert Durer, Lucas of Leyden, and Aldeghever.

The maſter of the caduceus was quite original in his ſtyle of engraving, but it has not been thought worthy of imitation, and his prints are now ſought after by the curious merely on account of their great rarity. He worked entirely with the graver: his courſes of lines, which are rarely croſſed, are rather feeble than delicate; his extremities are poorly marked, and always too large; his draperies are perplexed with ſmall and inelegant folds, and his heads neither characteriſtic nor expreſſive.

The principal works which have been mentioned as bearing this myſterious mark, are as follows. A ſmall upright plate repreſenting "Apollo and Diana." Another of the ſame ſize, of three men bound. "A Holy Family," in a ſmall ſquare plate, half figures: the Virgin is leaning on the ſtump of a tree, and the head of Joſeph is ſeen towards the right hand of the print. Another "Holy Family," a ſmall plate lengthways, where the Virgin is repreſented ſeated at the foot of a tree; the child is ſtanding by her ſide; Elizabeth is ſeated near him; an angel is playing upon a muſical inſtrument; and Joſeph appears at the right hand of the print. "The Adoration of the Three Kings," a ſmall upright plate; "St. Jerom writing, with a Crucifix before him," a ſmall plate lengthways. Two ſmall upright plates: one repreſenting a man carrying a boat, and the other, a woman with a child in her arms. Jerome Hopfer has copied both theſe figures on one plate, much larger, and decorated the head of the woman with ſtars and a glory. "A Sacrifice to Priapus," (which is generally attributed to M. Antonio, becauſe it has his tablet,) is copied ſmaller by this artiſt, and the indecency which appears in the former plate is here omitted. It repreſents a woman ſtanding by the altar, and another oppoſite to her, holding an infant; and an old woman's head appears in the background. This is the only print by this maſter, with which we are acquainted, that does not appear to have been engraven from his own compoſition; and it, more than any other circumſtance, aſſiſts us in ſettling his chronology.

Cornelius Matſys, or Metenſis, was born ſome time about the year 1500, and we believe in the Low Countries: though he appears to have reſided much in Italy; and it is not improbable that he was the diſciple of George Peins. We have a great number of engravings by him, both from his own compoſitions and thoſe of the Italian painters. His ſtyle of engraving bears ſuperior reſemblance to that of Babylone in neatneſs and delicacy of execution, but his figures are much more in the Italian taſte, and are not deſtitute of elegance and proportion. Strutt has ſuppoſed there were two artiſts of theſe names, but the foreign writers mention only one. His monogram will be found in our firſt plate of thoſe uſed by the engravers of the Low Countries.

We ſhall mention the following prints by this artiſt. "Erneſt, count of Mansfeld," a print of quarto ſize; "Cleopatra with the Aſp," a ſmall print, dated 1550. An old man and two old women, one of whom holds a baſket of eggs, a ſmall print, dated 1549. "Judith with the Head of Holofernes," dated 1539. A battle, a ſmall upright plate, from G. Peins. "A Holy Family," where the Virgin is repreſented holding the infant on a cradle, careſſing the little St. John, from Raphael, of folio ſize. (This is from the ſame picture that was afterward engraven by F. de Poilly in France.) "The Miraculous Draught of Fiſhes," from Raphael. The Plague, a ſubject known in Italy under the name of "Il Morbetto," engraved by M. Antonio, and regraved by Cornelius Met, with his monogram, and the name of Raphael, folio ſize. "Chriſt laid in the Sepulchre," from an etching by Parmegiano, of quarto ſize.

Of Jerome Boſche, or Bos, an ancient painter and engraver of groteſque ſubjects, we have already treated, (ſee the article Bos,) but, by miſtake, have placed his death in the year 1500, copying the error of Strutt. According to the beſt foreign authorities he was not born till 1498; the final period of his life they have not recorded. His Gothic manner of ſubſcribing his works will be found in our *Plate* I. of the monograms, &c. uſed by the engravers of the Low Countries.

Beſides thoſe of his works which we have already mentioned, he engraved "The Temptation of St. Anthony," on wood, which being dated in the year 1522, corroborates the chronology which we now offer. "The Miraculous Viſion of the Emperor Conſtantine," in quarto; "Jeſus baptized by John," a folio print, with the name of Bos. A folio print repreſenting a number of groteſque figures, inſcribed, "Al dat op," &c. Jer. Boſche. Another folio print of the ſame kind, inſcribed, "Deſe Jeronimus Boſch drollen." An allegorical print, of an elephant, inſcribed, "H. Bos inv." Paul de la Houwe, exc. in folio.

Cornelius Bus, or Boſc, or Vanden Boſch, was born at Bois le-Duc, in Flanders, ſome time about the year 1510. In his youth he went into Italy, and eſtabliſhed himſelf at Rome, where, excluſive of his profeſſion as an engraver, he carried on a conſiderable commerce in prints. A ſubject engraved by him, of females at different domeſtic employments, with a German inſcription, beginning thus, "Alim die ein from bidert Weib überkompt, &c." has made M. de Heinneken think that Cornelius was a German, and that in Italy he changed his name to Bus; but the general opinion is, that he was born where we have ſtated above, and that his true name was Boſch.

His ſtyle of engraving ſometimes reſembles that of Marc de Ravenna; at other times that of Eneas Vico. He never arrived at any ſuperior degree of excellence. He worked entirely with the graver, in a ſtiff, dry, ſtyle, without taſte. His drawing is by no means correct; neither are the heads and other extremities of his figures ſufficiently attended to; and from the lights being diffuſed, and the feebleneſs of the maſſes of ſhadow, his engravings are uſually deſtitute of effect. He has engraved after his own compoſitions and thoſe of other maſters; and he commonly marked his prints with one or other of the monograms which will be found attached to his name in our firſt plate of thoſe uſed by the engravers of the Low Countries.

The following prints may be reckoned among his beſt. "The Laſt Judgment," marked with his cypher, and dated 1530, of quarto ſize; "Lot and his Daughters," with his monogram, dated 1550, of folio ſize; "King David giving the fatal Letter to Uriah," dated 1546; "Our Saviour preaching to the Jews," in folio; "Venus on her Car," in quarto, dated 1546; "Vulcan in his Forge," in folio, 1546, all marked with his cypher; "Combat of the Centaurs and Lapithæ," on two large plates, dated 1550; "A Monk ſeized by Death," in quarto, marked with the monogram. An equeſtrian ſtatue of Marcus Aurelius, in folio, with the monogram. A ſet of ſixteen plates of groteſque arms and trophies, engraved at Rome in the years 1550 and 1553. Another ſet of caryatides and thermes. "Moſes receiving the Tablets of the Law," from Raphael, in folio, 1551; "Triumph of Bacchus," a large print, lengthways, engraved on three plates from Julio Romano, dated 1543; "The Entombing of Chriſt," a folio plate, dated 1554, from Franciſco Floris, marked "Cornelius Bus fecit;" "Moſes breaking the Tablets of the Law," folio, from Raphael, dated 1550.

Having already treated of the family of Breughel, which flouriſhed as painters and engravers at the period now under our notice (ſee the article BREUGHEL), it remains only to add in this place, that Peter Breughel the younger, ſurnamed, or rather *nick*-named "the Helliſh," was the principal engraver of that family, and the chief of his engravings (which are ſomewhat numerous, and rendered very entertaining by his peculiarities) are as follow. They are generally marked with a monogram, which will be found in our firſt plate of thoſe uſed by the engravers of the Low Countries.

A large folio plate of a village fete: a banner is diſplayed over the door of a cabaret, and of the numerous figures introduced, ſome are ſkirmiſhing, others rejoicing, and others quarrelling. Another folio print of "Peaſants rejoicing;" "The Feaſt of the Archers," in which the banner of their company is diſplayed before an arbour, inſcribed "Dit is de Gulde." A very rare wood engraving of a maſquerade, known by the name of "Valentine and Orſon;" "Mercury and Pſyche," the landſcape part of which is a view on the Rhine; "Dedalus and Icarus," companion to the above, being another view on the Rhine: both are inſcribed "Petrus Breughel fecit Romæ 1553;" and all the above are of folio ſize.

Early proofs of the works of Hieronymus, or Jerome Cock, are much ſought after by the curious, but it is on account of their ſcarcity and not their merit, for his ſtyle is laborious, poor, and ſcratchy. The praiſe which Vaſari has laviſhed on him, is therefore not merited. His biography we have already ſufficiently detailed, (ſee the article Cock), except that we have there omitted to mention that he was born at Antwerp in the year 1510. His monogram, ſimilar to that of Hans Collaert, will be found in our firſt plate of thoſe uſed by the engravers of the Low Countries. From his numerous engravings, we ſelect the following as thoſe which are held in moſt eſteem, beginning with his

Portraits.—A pair of the oval form, in 4to. of Francis II. king of France and Scotland, and Mary queen of Scotland and France. Another pair of Guſtavus and Maria, king and queen of Sweden. Another of Soliman, emperor of the Turks, and Camilia his daughter, all in ovals, and of folio dimenſions. A large folio plate, containing the heads of Guido, Cavaleantes, Dante, Boccacio, Petrarch, Politian, and Ficinus. And, conjointly with Wierix, a ſet of twenty-four of celebrated artiſts of Germany, in folio, dated 1572.

Proceſſions, Views, &c.—A ſet of fifty-nine, entitled "Præcipua aliquot Romanæ antiquitatis monumenta Antwerpiæ M. D. L. I." Another ſet of twenty, entitled "Operum antiquorum Romanorum hinc inde per diverſas Europæ regiones." "The Funeral Proceſſion of the Emperor Charles V." engraved on ſeveral plates, and forming, when paſted together, a long frieze. A ſet of twelve plates, entitled "Divi Caroli V. ex multis præcipuæ victoriarum imagines 1556." A ſet of fifteen, entitled "Compartimentorum quod vocant multiplex genus lepidiſſimis hiſtoriolis poetarumque tabellis ornatum, 1566. Gedruckt by Hieronymus Cock in de vier Winden."

Hiſtorical, &c.—"Moſes with the Tablets of the Law;" "St. Chriſtopher croſſing the Water with the Infant Chriſt," a ſubject from the life of Sylla, inſcribed "Quidquid eſt hujuſmodi etc.;" "A Sacrifice to Priapus," where the ſacrificers are repreſented ſlaughtering an aſs, 1557; "Fœmina ſub Jove ſunt;" Tarquin and Lucretia, "Tarquinius, &c." An emblem of Vanity, inſcribed "Hodie mihi, cras tibi:" it repreſents the dead bodyof a young man lying on a table near a ſkull: at the bottom of the print is written "Vigilate quia etc." Cock excud.; all in folio.

Various Subjects from the Painters of the Low Countries.—A ſet of fifteen hiſtorical landſcapes, painted by Mathew Cock, and engraved by Jerom, of which the ſubjects are; 1. Abraham ſacrificing Iſaac. 2. Judah and Tamar. 3. The Prophet Jonas weeping over Nineveh. 4. The Departure of Tobias with the Angel. 5. The Flight into Egypt. 6. The Baptiſm of our Saviour. 7. Jeſus tempted in the Deſart. 8. The good Samaritan. 9. Mercury and Argus. 10. Mercury killing Argus. 11. Venus mourning for the Loſs of Adonis. 12. Cephalus and Procris, 1558. 13. The wondrous Labyrinth. 14. The Loves of Hero and Leander. 15. Daphne metamorphoſed into a Laurel. A large landſcape, repreſenting the feſtival of St. George, with the banner of the ſaint, from Mathew Cock; "Sampſon and Dalilah," with the temple of the Philiſtines in the back-ground, in large folio, from Hemſkerck; "Daniel in the Lion's Den," in the back-ground are the Babylonians lamenting the overthrow of the dragon and Bel, and the prophet Habakkuk is conducted through the air by an angel, from the ſame maſter, in large folio. A ſet of eight, repreſenting the illuſtrious women of the Old and New Teſtaments, *viz.* Jael, Ruth, Abigail, Judith, Eſther, and Suſannah, from the old, and the Virgin Mary and the Magdalen from the new, in folio. An allegorical ſubject, repreſenting "Fraud and Avarice;" a bacchanalian ſubject of "Children dancing," both of folio ſize, all from Hemſkerck; "The Reſurrection of our Saviour," from Breughel the elder, in large folio; "The Temptation of St. James and St. Anthony," 1565, both in folio; and from the ſame maſter, "The Laſt Judgment," with the cypher of Cock, dated 1558, in large folio; "The Laboratory of an Alchymiſt," in folio; "The Carnival, or Diſpute between the Fat and the Lean," in two folio plates, dated 1563. A ſet of twelve hiſtorical landſcapes, moſt of them ſacred ſubjects, with Latin inſcriptions, of large folio ſize, etched by Jerom Cock, all of them from the elder Breughel. A groteſque compoſition of "The large Fiſh devouring the ſmaller," from Jerom Bos; it is inſcribed "Vrinden dit heeftmen reel Jaren geweten Dat de groote Viſſen de cleynen eten," in large folio. A large folio print of "The Temptation of St. Anthony," inſcribed "Multæ tribulationes." "St. Martin in a Boat with Devils," in large folio; "A Dream," 1561; "Shrove Tueſday," an allegorical ſubject, of large folio ſize, 1567; "De Blau Schuyte," "The Blue Ship," in large folio, all from Jerom Bos; "The Combat of the Horatii and Curiatii," after Franc Floris; "Hercules ſleeping, aſſailed by Pigmies," from the ſame maſter, both in large folio; "King Ahaſuerus, ſurrounded by his Court, inveſting Eſther with Royalty," from Lambert Lombard; "Jeſus with his Diſciples, at the Houſe of Martha and Mary," 1556, in large folio; "Jeſus at Table in the Houſe of Simon the Phariſee," 1551, in folio; "The Reſurrection of Lazarus," both from the ſame maſter, in large folio, all inſcribed H. Cock, exc.

Subjects from Italian Maſters.—"Abraham offering up Iſaac," and the angel appearing with a ram, from Raphael, 1552, in folio; "The Nativity," from the ſame painter, in folio; "Many are called, but few are choſen," in large folio, from Andrea del Sarto, dated 1553; "Females bathing," a folio print, from Lucas Penni; "Captives repoſing," a frieze from Polidore; "The Paſſage through the Red Sea," from Angelo Bronzino, in folio; "The Viſitation of Elizabeth," from Sebaſtian del Piombo, in folio.

Jacob Boſius, or Boſſius, ſurnamed in Italy *the Belgian*, was born in the early part of the ſixteenth century, but in what part of the Low Countries we are unable to ſay. He ſtudied in Italy under ſome one of the diſciples of Marc Antonio, but never roſe above mediocrity. His ſtyle is neat, but wants both freedom and correctneſs of outline. The extremities of his figures eſpecially are heavy and not well marked.

He often marked his engravings with two B's, which ſhews that he adopted the ſurname of Belgia, which was conferred on him by the caprice of the Italians. The time of his death has not been mentioned.

Of his works the following few appear to include all the variety which Boſſius was capable of exerting, and more than he could exert with credit as an artiſt.

The portrait of Michael Angelo, in octavo. Buſts of St. Thomas Aquinas, and Otho Truchſeſs, biſhop of Albany, in quarto. "The Crucifixion," in folio. A ſet of the four Evangeliſts, after Blockland, in quarto. "Jacob's myſterious Dream," and "St. Peter and St. John healing the Cripple" both in folio, and after Raphael. The ſtatue of Pyrrhus, king of the Moloſſes, from the antique, in folio, dated 1562; and "The Baths of Diocleſian," with other views of antiquities executed in conjunction with Ant. Lafreri.

Lambert Suterman, or Suavius, was born at Liege, in Flanders, in the year 1510, and became the diſciple of Lambert Lombard, with whom Sandrart confounds him; but Heinneken has removed all doubt on the ſubject, proving that Lombard was merely a painter and never uſed the graver at all.

Suavius engraved many plates both from his own deſigns and thoſe of his maſter. His figures are generally tall and thin; the outlines of the naked parts of them are tolerably correct, but dry and without dignity. His draperies are generally divided into ſmall folds, which by not being ſufficiently varied or contraſted with each other, form unpleaſing lines. The attitudes of his figures are ſeldom well choſen, or properly adapted to the ſubject, and the management of the light and ſhade by no means commendable. His ſtyle of engraving is very neat, and ſeems to have been contracted in the German ſchools; but his mode of deſign diſcovers more of the Italian than the German taſte.

His engravings are numerous, but neither exquiſite nor very rare; we ſhall mention the few following

From Lambert Lombard.—"Charity," ſurrounded by eight children; "The Reſurrection of Lazarus," both in quarto, dated 1544; "Jeſus travelling to Emmaus, with his two Diſciples," in folio; "The Entombing of Chriſt," in quarto; "St. Peter and St. Paul healing the Sick;" "The Deſcent from the Croſs," and "Our Saviour reſtoring the Widow's Son," all in folio; "Pſyche with the Vaſe of Proſerpine and Juno," marked with the name of Raphael, in ſmall folio.

From his own Drawings.—"The twelve Apoſtles," in quarto. Two circular prints, repreſenting a profile of our Saviour, and one of the Virgin Mary. A buſt of Melchior Schets, in a circle, inſcribed "Mundus regitur opinionibus," 1561; Anna Stralen, "Mel Scheti conjux," 1554; "Michael Angelo Buonarotus, nobilis Florentinus," a circular print; and a portrait of Cardinal Granvelle, in quarto. All the portraits by Suavius are executed in a very delicate ſtyle.

The family of Goltzius were illuſtrious in art. Hubert, the firſt of that name who diſtinguiſhed himſelf as an engraver, was the ſon of a painter of Wurtzburg, but was born at Venloo in the year 1520. Under the tuition of his father and of Lambert Lombard, he acquired ſome proficiency both in arts and in letters, and, having to copy ſome drawings which had been done from the antique, at the houſe of the latter, they excited in him ſo ſtrong a deſire to ſee and ſtudy from the originals, that he forthwith ſet out for Rome. After remaining ſome time in that diſtinguiſhed metropolis, he travelled homeward through Italy, France, and Germany, leaving few of the celebrated works of art, or European monuments of antiquity, unſeen; and finally eſtabliſhed himſelf at Bruges, where he ſucceſſively publiſhed thoſe volumes of medals, inſcriptions, and other objects of antiquarian reſearch, collected during his travels, which are ſtill ſought after by the curious; and where he died in the year 1583.

Strutt ſays, "he was twice married, and the abominable croſſneſs and ill temper of his ſecond wife (ill ſuited as a companion to a ſtudious man) is ſaid to have ſhortened his days." Moſt of his antiquarian writings are compoſed in the Latin language, and were printed, as well as their engraved accompaniments, in his own houſe.

Hubert painted ſome few pictures which have been ſpoken of with commendation, and are valued for their rarity, but is chiefly known as a man of letters and an engraver. He obtained the title of painter and hiſtorian to Philip II. of Spain, to whom he dedicated, "Faſti Romani ex antiquis numiſmatibus et marmoribus ære expreſſi et illuſtrati;" and "Icones Imperatorum Romanorum, et ſeries Auſtriacorum, &c." both in folio, and printed at Bruges.

The medals in theſe works are executed in *clair obſcure;* and it has ſince been copied and reprinted at Antwerp by Balthaſar Moret, who has added five medallions from deſigns by Rubens, in order to bring down the ſeries to the time of Ferdinand III.

The manner in which Goltzius produced his prints in clair obſcure, was by firſt printing from an outline etched on copper, and afterward impreſſing the half tint and deeper ſhadows from the ſurfaces of blocks of wood and with the letter-preſs. In this manner our artiſt produced two other works, adorned with numerous engravings by himſelf and Joſeph Gietleughen of Courtrai, of which the firſt, printed at Bruges in 1563, and containing forty-ſix prints, is entitled "C. Julius Cæſar ſive hiſtoriæ Imperatorum Cæſarum Romanorum ex antiquis numiſmatibus reſtitutæ, liber primus, Huberto Goltzio Herbipolita Vanloniano Auctore et Sculptore;" and the ſecond, containing two hundred and thirty-four engravings, printed at Bruges in 1566, bears the title of "Faſtos Magiſtrorum et Triomphorum Romanorum ab urbe condita ad Auguſti obitum ex antiquis Monumentis reſtitutos, Hubertus Goltzius Herbipolita Venlovianus dedicavit."

Henry Goltzius was a man of more genius, though of leſs reſearch, than Hubert. His father, John Goltzius, was a painter on glaſs, of Mulbrech, in the neighbourhood of Venloo, where our artiſt was born in the year 1558.

After acquiring ſome knowledge in the rudimental part of drawing under his paternal roof, Henry was placed, firſt under Jaques Leonherd, and afterward became the diſciple of Theodore Coornhaert, who taught him engraving, and under whoſe tuition he ſoon began to diſcover very ſurpriſing talents in that novel and difficult art, notwithſtanding the diſadvantage of a lame hand, which was occaſioned by falling into the fire during his infancy.

Goltzius afterwards worked, for a ſhort time, for Philip Galle, but in conſequence of domeſtic troubles and an ill ſtate of health, occaſioned partly by his too cloſe profeſſional application, was adviſed to travel. His deſire of improvement coinciding with his medical adviſers, he paſſed through Germany into Italy, viſiting Bologna, Florence, Naples, Venice, and Rome, frequently aſſuming a feigned name, that he might with the leſs interruption apply himſelf to the ſtudy of the antique and the *grand guſto* of Michael Angelo.

Now was the time when what the profeſſor Fuſeli terms the "frantic pilgrimage" of artiſts to Italy, raged with cruſading zeal, and no painter in the eſtimation of the hypercritics, might be conſidered as perfect in his art, who had not trembled before the Laſt Judgment of the terrible Michael Angelo; moderation in ſtyle, was inſenſibility; and Goltzius himſelf, though a man of diſcernment, became infected to a certain degree with the faſhionable bombaſt.

In the genial climate of Italy his health returned, and at Rome he remained for ſome years, producing there ſeveral very excellent engravings from Raphael, Polidoro, and other eminent maſters. He finally returned to the Low Countries, and eſtabliſhed himſelf at Haerlem, where he engraved many plates, of which the ſubjects conſiſt partly of his own compoſitions, and are partly taken from the drawings which he copied from celebrated works of art during his reſidence in Italy, where, in 1617, he died at the age of fifty-nine years.

He married a widow lady of Haerlem, whoſe ſon James Maetham (the fruit of a former marriage) became (as we ſhall have occaſion to notice) a diſtinguiſhed engraver, under the inſtruction of his father-in-law. He is ſaid to have been forty years of age before he began to paint. His pictures are few in number, and their rarity perhaps has raiſed them to a higher value than they might elſe have attained.

But we have to ſpeak of him chiefly as an engraver. Poſſeſſing conſiderable anatomical knowledge, he drew the human figures admirably, and articulated the joints and extremities with ſuperior ſkill. But conceiving himſelf qualified, on his return from Italy, to correct the littleneſſes and Gothic ſtiffneſs of his Dutch and German contemporaries in art, and the taſte which prevailed among the connoiſſeurs of the Low Countries, he too frequently ran into the oppoſite extreme, and twiſted and bent his fingers and his feet, ſometimes into abſolute diſtortion, in ſpite of nature and his own ſuperior knowledge. While the mania laſted, his intended grace became real affectation, and his grandeur ridiculous ſwaggering.

In order to ſhew that the revolution in ſtyle which he aimed at accompliſhing, was the reſult of ſuperior powers, and that it proceeded not from his inability to emulate and excel, at their own weapons, the heroes of Holland and Germany, he took a moſt effectual method, in the proſecution of which he was eminently ſucceſsful. He compoſed and engraved what are termed his chef-d'œuvres, or *maſterpieces*, which ſhew the amazing verſatility of his talents; and which, though chiefly aimed at the reputations of Albert Durer and Lucas of Leyden, does not ſcruple to provoke compariſon alſo, with Baſſan, with Parmegiano, and even with Raphael himſelf.

There had not been wanting among the connoiſſeurs and amateurs of the Low Countries, ſome who inſinuated that Goltzius deviated from the ſtyles of art which had called forth their admiration, becauſe he had fancied or found them to be inimitable. No expedient could more juſtly or more completely have ſilenced theſe obſervations, than the contrivance and execution of theſe ſix large engravings. Before he made public that of which the ſubject is "The Circumciſion," and which was deſigned to vie with Albert Durer; and before his general purpoſe was known, he beſtowed a few years of age on an impreſſion, by means of ſmoke, and exhibited it in the preſence of a choſen few, who, to the great entertainment and ſecret ſatisfaction of our artiſt, ſtood in ſpectacles and in raptures, before the ſuppoſed engraving of Albert Durer. And, in truth, this print ſo very much reſembles the very beſt works of that maſter, both in deſign and execution, as to be ſcarcely any impeachment of the diſcernment of the connoiſſeurs who were thus deceived.

Goltzius might now fearleſsly publiſh his maſter-pieces, which he did with extraordinary ſucceſs, and in which, after varying his ſtyle five times in order to imitate ſeverally the maſters above-mentioned, he finiſhes the ſet of ſix with an "Holy Family," which he meant ſhould be underſtood as the improved ſtyle of Henry Goltzius, and which cloſes the proceſſion, and completes his triumph,—but not the catalogue of his merits.

He engraved portraits from his own drawings, in a very maſterly manner, very taſtefully uniting excellent drawing, and vigorous effect of light and ſhade, with neatneſs of execution. He alſo engraved from his own compoſitions on wood, in the manner which is technically termed *clare obſcure*, or *chiaroſcuro*, in which he differed from Hubert Goltzius, by employing *three* blocks of wood; on the firſt of which he cut his outline with great boldneſs and ſpirit; the ſecond ſerved to impreſs the demi-tints, the high lights being cut away; and the third the deeper ſhadows. In the works which he executed in this way, the lights appear as if emboſſed, and they are on the whole very maſterly productions.

The power of Goltzius over his graver, which was the chief inſtrument of his art, and the freedom, boldneſs, and copious variety of combination with which he hatched his courſes of lines, is wonderful, and would have been truly faſcinating, had he adhered to that pure and accurate ſtyle of drawing which once diſtinguiſhed him, inſtead of deviating into extravagance and eccentricity.

The cypher with which he marked his engravings, when he did not ſubſcribe his name at length, may be ſeen in our firſt plate of thoſe uſed by the engravers of the Low Countries.

We begin our catalogue of his works, which will probably long continue to rank in the very firſt claſs of the arts of his country, with his

Portraits.—A buſt of Gertrand Adriaanſſz Brederods, in an oval, with an allegoric accompaniment of two tigers and a laurel, a very rare print; Henry III. king of France, an oval, very rare, dated 1592; Frederic II. king of Denmark, quarto ſize; William prince of Orange, in an oval, ſurrounded with a groteſque border, in folio; Charlotte of Bourbon, princeſs of Orange, companion to the preceding; both engraved in a very delicate ſtyle; Theodorus Coornhertius ad vivum depictus et acri inciſus, ab H. Goltzius, a very rare folio print; Hans Bol, after Joannes Boltius, a folio print, ſurrounded with ornaments; John Stradan, a painter of Bruges, in quarto; Philip Galle, an engraver of Antwerp, of the ſame ſize, dated 1582; Peter Foret, or Foreſtus, a Dutch phyſician, in octavo, dated 1586; Juſte-Lipſe, a celebrated critic, inſcribed "Moribus antiquis," dated 1587; a half-length portrait of John Zurenus, painted by M. Hemſkerck, in quarto; Monſieur de la Faille, inſcribed "Leges tueri. Harm. Adolfs. exc." in quarto; Madame de la Faille, companion to the above, (a young woman with a ſkull in her hand.) This pair of portraits are executed with extreme delicacy, and are much celebrated. Chriſtopher Plantin, a famous printer; and Francis d'Egmont, completely armed, a half-length portrait, both in quarto; Robert, earl of Leiceſter, general in the United Provinces, 1586, a very fine print, in a ſmall oval; S. Sovius, inſcribed, "Bene agere et nil timere," 1583, rare; a half-length portrait of a man meaſuring a globe, inſcribed "L'homme propoſe, et Dieu diſpoſe," 1595. This is believed to be the portrait of Petri, an aſtronomer of Amſterdam, in 12mo. A lady ſitting in a garden chair, ſuppoſed to be the portrait of Catherine Dekker, of Haerlem, of the ſame ſize; buſt of a man with a round hat, in 4to.; buſt of a female with a hat, executed entirely with the graver; half-length portrait of a female, veiled, and covered with drapery, 1606, taſtefully engraven in a neat and elaborate ſtyle; and the buſt of a man, with a cocked hat, both of quarto ſize.

Various Subjects from his own Compoſitions.—A circular print in quarto, of "Judah and Tamar," one of the earlieſt engravings of Goltzius. A ſet of ſix capital prints, which we have particularly noticed in his biography, and which are known by the name of the *maſterpieces* of Goltzius. 1. The Annunciation, in the ſtyle of Raphael. 2. The Viſitation, in the ſtyle of Parmegiano. 3. The Annunciation, in the ſtyle of Baſſan. 4. The Circumciſion, in the ſtyle of Albert Durer. 5. The Adoration of the Kings, in the ſtyle of L. of Leyden. And 6. A Holy Family, in his own ſtyle, or, according to ſome critics, in the ſtyle of Baroccio, all of large folio ſize: it ſhould be known, that in the Circumciſion he has introduced his own portrait. A very rare print of "The Nativity," in large folio, which is unfiniſhed; inſcribed Jac. Matham, exc. 1615. "The Adoration of the Kings," in quarto. rare; "The Slaughter of the Innocents," C. Viſſcher excud. likewiſe very rare; and in an unfiniſhed ſtate, a very large folio. "A Repoſo," H. Goltzius fecit. in 4to. 1589; "The Good Samaritan," H. Goltzius ſc. et excud. 1589; The Paſſion of our Saviour, in twelve plates, H. Goltz. fec. 1597, in 4to. Theſe are engraven ſomewhat in the ſtyle of Lucas of Leyden. The half-length figures of Chriſt, and thirteen apoſtles, with Latin inſcriptions, engraved on fourteen plates, H. Goltzius fec. in octavo, 1598. Another ſet from the ſame originals, ſaid by Huber and Roſt to be almoſt as large as life, and the name of each apoſtle added; executed with very bold courſes of lines. "The Adoration of the Kings," a ſingular compoſition, and a very rare folio print; "The Infant Chriſt," ſeated on a cuſhion holding a globe, and ſurrounded with a glory of angels, a very finely engraved plate, in 4to. dated 1597; "The Temptation of St. Antony," and "A Saint, holding a Book," (perhaps Jerome,) both in quarto. A ſet of fifty-two, from the Metamorphoſes of Ovid: it is believed that Goltzius was aſſiſted by his pupils in the execution of this ſet. A ſet of ten of the heroes of ancient Rome, *viz.* 1. The Horatii and Curiatii. 2. Horatius Cocles. 3. Mutius Scævola. 4. Curtius. 5. Torquatus. 6. Corvinus. 7. Manlius. 8. Calphurnius. 9 and 10 are allegorical ſubjects. This ſet is executed with very bold ſtrokes, and have very fine back-grounds. A circular print of Venus reſting againſt a tree, and Cupid preſenting a ſword, inſcribed "Sine Cerere et Baccho, friget Venus," executed in ſo very delicate a manner, that it forms a ſtriking contraſt with the former. A ſet of three ovals, repreſenting 1. Bacchus; 2. Venus; and 3. Ceres, dedicated to Cornelius of Haerlem. Another ſet of three ovals, of 1. Pallas; 2. Juno; and 3. Venus, dated 1596. A couchant Venus, ſurrounded by the four elements, perſonified by cupids, an oval print, all of folio ſize. "Mars and Venus, expoſed to the Ridicule of the Gods," 1585, in large folio. Three folio plates of the loves of the gods; 1. Jupiter and Juno. 2. Neptune and Amphitrite. 3. Pluto and Proſerpine. "Apollo in the Clouds," with an inſcription round his head, 1588; "Pygmalion and the Statue," 1593, all in folio. A ſmall oval print of "Mercury and Argus," very rare; the nine muſes, dedicated to John Sadeler, dated 1592, in folio; three folio circular prints of "The Deſtinies;" "The three Graces," crowned with laurel, in folio; a large folio print of "Apollo Pythius, Statua antiqua Romæ, in palatio Pontificis Bellevedere, etc." "Hercules ΑΛΕΣΙΚΑΚΟΣ Inſcriptus Roman. Commodus Imperator. Statua antiqua Romæ, in palatio Pontificis Bellevedere, etc." in large folio, with four Latin verſes; and "Hercules Victor. Statua antiqua Romæ, in palatio Cardinalis Farneſii, etc." publiſhed after the death of Goltzius by Herman Adolf, in large folio. Theſe three ſtatues form a very beautiful and intereſting ſet, where the vigorous powers which diſtinguiſh the graver of Goltzius, are exhibited in high perfection. "Hercules;" in the back-ground are repreſented ſome of his labours; of very large folio ſize, dated 1589. In this print the artiſt appears to have intended to convey an idea of godlike ſtrength, but has run far into the extravagance which we have cenſured in his biography. "Apollo playing on his Lyre, ſurrounded by the Muſes," a very large print, dated 1590. The ſeven cardinal virtues; Faith, Hope, Charity, Juſtice, Prudence, Fortitude, and Temperance; of quarto ſize; ſeated on ornamental architecture. Three very fine prints, in folio. Eight females embracing, repreſenting human virtues in four very fine folio prints; "Labour and Diligence, (perſonified by a man and female,) embracing," a very rare quarto print, dated 1582. A naked infant reſting againſt a ſkull; an emblem of human vanity, in large quarto. "Chriſtian Prudence," repreſented by a drapered female, inſcribed "Aſtute ſerpentes, et ſimplicitate columbas," a very rare engraving, in a ſmall circle; "The Blind leading the Blind," a ſmall circle, very rare; "The War Chariot," with an explanation in French and Dutch, of large folio ſize. A young female, refuſing the offer of a rich old man, followed by a young one. A companion, of a young man refuſing an old woman, both rare prints, and of folio dimenſions. "The Dog of Goltzius," or "The Boy and Dog:" it is pretended by ſome that the boy who is introduced is the ſon of the Venetian painter Theodore Friſius, to whom the print is dedicated; and by others that it is the portrait of the engraver himſelf: it is in large folio, an exquiſite print, and the good impreſſions are now become rare and valuable. "Coridon au Silvia," a paſtoral ſubject beautifully engraven. A man in a Spaniſh dreſs, carrying two flowers, in folio, inſcribed "Sic tranſit gloria mundi." An officer with a halbert, with a battle in the back-ground, in fol. An officer marching, and a view of the city of Prague in the back-ground, 1587. A grand mountainous landſcape with ſhepherds tending their flocks in the fore-ground; and in which Dedalus and Icarus are ſeen in the air; a large folio print, and one of the fineſt etchings by Goltzius.

Engravings on Wood, in Clair-obſcure, and Cameo.—A landſcape, with ruſtic buildings, and a female drawing water from a well, in 4to. A landſcape, with an enormous rock on the ſhore of a raging ocean, and an hermit proſtrate, in 4to. A ruſtic ſubject with ſheep feeding, in 4to. Half-length portrait of a warrior, with lance and helmet, in folio. "Hercules combating with the Giant Cacus," engraved on a ſingle block, in folio. The ſame ſubject executed in clair-obſcure. A ſet of ſeven figures of heathen divinities, *viz.* Jupiter, Neptune, Pluto, Thetis, Flora, Night, and Eternity; theſe prints are in ovals of large folio ſize, and have a very ſtriking effect.

Subjects from Italian Maſters.—"St. Joachim," from a picture by Raphael in the church of St. Auguſtin at Rome, dated 1592, in folio; "The Triumph of Galatea," from a picture by Raphael, in the Farneſian gallery. Eight divinities in niches, from Polidoro; *viz.* Saturn, Neptune, Pluto, Vulcan, Apollo, Jupiter, Bacchus, Mercury, in folio. Two ſybils, after antique ſtatues, in 4to. "The Laſt Supper," from a very grand compoſition by Paul Veroneſe, dated 1585; "The Marriage of Cana," after J. Salviati, a very large engraving, executed on two plates; "St. Jerom meditating in a Deſart," from Palma the younger, in large folio.

Subjects from various Maſters in the Low Countries.—"The Fall of our firſt Parents," in 4to. from Barth. Spranger, 1585; "A Dead Chriſt," ſupported by an angel, from the ſame maſter, in large folio; "The Celebration of the Nuptials of Cupid and Pſyche among the Gods," from the ſame maſter, executed on two large plates; "The Dragon devouring the Companions of Cadmus," after Corneille Cornelius, in folio, 1588; "Ulyſſes reproving Irus before the Suitors of Penelope," from the ſame maſter, in large folio. Large circular prints of the four elements, repreſented by Tantalus, Icarus, Ixion, and Phaeton; "St. Paul ſhaking off the Viper, in the Iſle of Melita," from J. Stradan, in folio; "Lot and his Family forſaking the burning City," from Ant. Blocklant, dated 1582, in large folio; and "The four Evangeliſts at the Sepulchre of Chriſt," from the ſame maſter, 1583, of large folio dimenſions.

Julius Goltzius was probably of the ſame family with Henry, but the acquiſitions of genius are unalienable, and Julius attained to no eminence as an engraver. He was apparently educated in the ſchool of the Galles, but of his birth or death there is no record, though his principal work was executed in 1581. He engraved on copper, but his objects are ill drawn and taſteleſsly executed. Great part of the figures in "Habitus Variorum Orbis Gentium," publiſhed by Boiſſard, is from his hand, as are alſo "The good and bad Shepherd," from Martin de Vos, and "Chriſt appearing to Mary Magdalen," after Fred. Sucaris.

Henry Van Cleve, or Cleef, alſo called *Clivenſis*, was born at Antwerp in the year 1520, and died in the ſame city in 1589. He was the brother of Martin van Cleef, whom Vaſari confounds with Martin Schoen. He ſtudied in Italy, and beſide his proficiency in engraving, became an excellent landſcape painter, poſſeſſing great freedom of touch, and producing an harmonious chiaroſcuro. Upon his return to his native city in 1555, he was elected a member of the Antwerp academy of painters: he likewiſe engraved a great number of plates, which he ſometimes marked with the monogram, which will be found in our firſt plate of thoſe uſed by the engravers of the Low Countries; and at others, with "Henricus Clivenſis fecit."

Among his works the following will probably be found moſt worthy of ſelection. A bull fight, exhibited at Rome, before the Farneſe palace, in folio. Two landſcapes and figures, in folio. A ſet of ſix landſcapes, intitled, 1. Veneris Templum. 2. Forum Æmilii. 3. Templum Fortunæ. 4. Caloris. 5. Cataractes Tiburti. 6. Corfu Inſula. H. van Cleef fec. Ph. Galle exc. in folio. Another ſet of landſcapes: 1. View of a bridge at Segovia. 2. A promontory at Campania. 3. The tomb of the Horatii. 4. A view on the lake of Aricia, in folio. There is alſo a collection of thirty-five views by this artiſt, publiſhed under the title of "Henri a Cleve ruinarum ruriumque aliquot delineationes executæ, per Galleum," in folio.

Of his brother Martin van Cleef we know very little, and of his engravings nothing, excepting that profeſſor Chriſt ſays, they were marked with a monkey ſeated, with the letters V. C. upon its body, in the manner repreſented in our *Plate* I. of the monograms, &c. uſed by the engravers of the Low Countries.

A monkey it ſeems, which in England is nicknamed Jacko, is called Martin in Flanders: combined with the initials of Van Cleef, it therefore formed a kind of pun; and the age in which theſe engravers lived, is known to have been a time when puns were faſhionable, and paſſed for wit. Martin van Cleef, ſometimes miſtaken for Schoen, is the real Martin of Antwerp, of Vaſari, and thoſe Italian writers who have copied his errors.

Adrian Collaert, the elder, an artiſt of great merit, and likewiſe a printſeller, was born at Antwerp A. D. 1520. He became acquainted with the rudiments of his art in his native country, but made a journey to Italy, where he reſided ſome time in order to perfect himſelf in his profeſſion. He worked entirely with the graver in a firm and neat ſtyle, but ſomewhat ſtiff. His maſſes of light are rarely well managed, or ſkilfully blended with his demi-tints, and from being too much ſcattered and without the neceſſary graduation, he rarely produced even a tolerable chiaroſcuro. But to compenſate theſe defects (which may, in part at leaſt, be aſcribed to the age in which Adrian lived), he drew with great ability. The heads of his figures are frequently beautiful and characteriſtic, and the other extremities well marked.

The engravings of the elder Collaert are ſomewhat numerous, and are generally marked with a cypher, for which ſee our firſt plate of thoſe uſed by the engravers of the Low Countries. We ſelect from them the following, beginning with thoſe which are done

From his own Compoſitions.—A man and his wife conducted by Death, dated 1562, in 12mo. An armed warrior, to whom a female preſents a dog, a child, and a cock. The four elements, with a verſe in Latin under each, in 8vo. A ſet of thirty-ſix prints, in 12mo., entitled "Vita Jeſu Salvatoris variis iconibus, ab Adriano Collaert expreſſa." A ſet of thirty, in 4to. entitled "Avium vivæ icones in ære inciſæ et editæ ab Adriano Collardo." One hundred and twenty-five ſubjects, entitled "Piſcium vivæ icones." Another ſet, entitled "Florilegium ab Hadriano Collaert cælatum, et ab Phil. Gallo editum;" in twenty-four 4to. plates. A large folio plate from the "Laſt Judgment" of Stradan. "St. Anthony tormented by Devils;" and "St. Apollonius," ſurrounded by ſubjects from his life, both of folio dimenſions.

From various Maſters.—The twelve months of the year, from Joſhua of Momper, of 4to. ſize: the ſame ſubjects were copied by Callot. A ſet of twelve beautiful horſes in various attitudes, from Stradan, 8vo. plates, engraved very delicately. A ſet of chaces and fiſhing parties, from Stradan, in 4to. Four fine landſcapes from H. van Cleef, entitled "Regionum rurium varii atque amoeni proſpectus." A ſet of hermiteſſes, from M. de Vos, in the engraving of which, Adrian was aſſiſted by his ſon, 4to. ſize. "The Iſraelitiſh Women ſinging the Pſalm of Praiſe for the Deſtruction of the Egyptian Hoſt in the Red Sea," a 4to. plate from Stradan; "Maternal Love," preſumptively a ſatirical print, its real ſubject being a woman tearing her child to pieces with the fury of a lion, in 4to. from the ſame maſter; "The Vocation of St. Andrew," from Baroccio, in folio. This ſubject was likewiſe engraven by G. Sadeler. "The Myſtery of the Maſs," from Th. Bernard; "A Repoſe during the Flight into Egypt," where St. Joſeph is repreſented gathering grapes, from H. Goltzius, dated 1585. The Annunciations of Iſaac, Sampſon, St. John the Baptiſt, and our Saviour. St. Joſeph, and the Angel of the Shepherds, from the ſame maſter, 1586, all of folio dimenſions. Theſe laſt ſix plates are reckoned the beſt engravings of Collaert.

Hans, or John Collaert, the ſon of the preceding artiſt, was born at the ſame place, in the year 1540. He learned the elements of art of his father, but afterwards went to Italy for improvement. He aſſiſted his father in moſt of his larger works, beſides engraving a great number of plates himſelf; which he did in a ſtyle very much reſembling that of Adrian. He muſt have lived to a great age, for his prints are dated from 1555 to 1622. He marked his plates with his initials, combined in a cypher, which will be found in our firſt plate of thoſe uſed by the engravers of the Low Countries, and ſometimes his name at full length. Among his works we ſhall ſpecify the following, beginning with thoſe

From his own Compoſitions.—Ten ſubjects in 4to. dated 1581, entitled "Monilium Bullarum inauriumque artificioſiſſimæ Icones Joannis Collaert opus extremum." The hiſtory of St. Francis, in a ſeries of ſixteen plates, with groteſque ornaments, in 4to. "A Chriſt," accompanied by two other half-length figures, perhaps intended for Moſes and Elias, in an ornamental border; "A Dead Chriſt on the Lap of the Virgin," inſcribed "Torcular Calcavi etc. Joan Collaert ſculp.;" "The Laſt Judgment," ſurrounded with ſmall ſubjects from the life of Chriſt, inſcribed, "Hunc veniant juſti, etc." all of folio dimenſions; "Marcus Curtius precipitating himſelf into the Gulf;

and " Peace and Charity," with the motto " Pacem habete ;" both of folio ſize.

From various Maſters.—" St. John the Baptiſt preaching in the Deſart," a grand compoſition, in folio, inſcribed G. A. Z. inventor ; " Moſes ſtriking the Rock," a large print, lengthways, from Lambert Lombard. A great number of ſmall figures are introduced into this print, and they are admirably well executed : the heads are fine, and the drawing very correct. This is conſidered as one of the beſt prints from the graver of John Collaert : it was publiſhed by Jerome Cock, 1555, and is marked " Hans Collaert fecit." " A Satyr purſued by Females," from J. Straden, in folio ; " A female Centaur ſuckling her young ;" and " A Centaur nurſing a young Bear," (companion to the laſt ;) " Mars repoſing on the Lap of Venus," in 4to., both from the ſame painter ; " The Loves of Mars and Venus," in four plates, with Latin verſes, in folio. From Philip Galle of Haerlem. The following prints, for the miſſal of Moretus, from the deſigns of Rubens, are much ſought after by connoiſſeurs : 1. The Annunciation. 2. The Nativity, with the Adoration of the Shepherds. 3. The Adoration of the Eaſtern Kings. 4. The Laſt Supper. 5. The Crucifixion. 6. The Reſurrection. 7. The Aſcenſion. 8. The Deſcent of the Holy Ghoſt. 9. The Aſſumption. 10. An Aſſemblage of the Saints in Heaven. 11. David imploring the Mercy of God on his People, afflicted with the Plague. And, 12. The Tree of Genealogy of the Jewiſh Kings ; all in ſmall folio. This laſt ſubject is very rare.

The following are likewiſe from the compoſitions of Rubens : " Theology," perſonified by a female, holding a flaming torch, on each ſide of whom is a Thermes, repreſenting the old and the new laws. Frontiſpiece to The Eccleſiaſtical Hiſtory from the Birth of Jeſus Chriſt to the Year 1622, wherein Religion is introduced holding a croſs and tiara. Frontiſpiece to The Lives of the holy Fathers, by T. Vaders.

William Collaert was the ſon of John, and engraved with ſome ability. Of his works we are only acquainted with " The Viſitation of Elizabeth," in folio ; and a ſet of ten quarto plates for " Bullarum Inaurium, &c. Archetypi Artificioſi," from the deſigns of his father.

Theodore or Dirick Volkart Coornhaert, or Cuerenhert, was born at Amſterdam in the year 1522, and became one of that extraordinary claſs of men, whom the world honours with the epithet of ſingular or eccentric whilſt they are living, and rarely knows how to value till they are no more. In other words, Coornhaert was a ſtudious man, of various and extenſive attainments, and whoſe perceptions and reflections were entirely his own.

Beſide cultivating the arts of deſign, he diſtinguiſhed himſelf in various literary purſuits ; was a good poet, and at leaſt an original theologian. In his youth he travelled into Spain and Portugal ; but the motives or reſult of his journey, which was perhaps connected with ſome diplomatic purpoſe, have not been aſcertained.

Returning to the Low Countries, he eſtabliſhed himſelf as an artiſt and ſcholar at Haerlem, of which city he became public ſecretary, and was ſeveral times ſent as ambaſſador to the prince of Orange, to whom he addreſſed a manifeſto, which has been celebrated, and which was publiſhed by that prince in the year 1566.

But unfortunately for the temporal concerns of our artiſt, he deemed that religion was an affair between every individual man and his Creator, in which no other man had a right to preſcribe tenets of doctrine or modes of faith. He, moreover, perceiving how the prieſthood degraded themſelves by worldly purſuits, had the wiſdom or the folly to maintain, that the channels of ſpiritual communication had become corrupt ; and that without a ſupernatural miſſion, accompanied by the power of working miracles, no perſon had a right to adminiſter in any religious office.

Such direct heterodoxy could not fail to draw on him violent and empaſſioned oppoſition of the clergy. Both parties became heated by diſputation. The prieſts anathematized ; and Coornhaert proceeded to pronounce that man to be unworthy the name of Chriſtian, who would enter any place of public worſhip ; a doctrine which he not only advanced by words, but evinced the ſincerity of his belief, by abſtaining from all churches, and from all ghoſtly communication with both Proteſtants and Papiſts.

It is needleſs to add, that his deſtruction was now complete. After being ſeveral times impriſoned, during the progreſs of the controverſy, without abjuring his hereſies, he ſuffered the martyrdom of baniſhment, and died at Dergoude at the age of 68 years, perſevering in his religious opinions to the laſt.

Coornhaert had, early in life, acquired ſome knowledge in engraving, among his various purſuits, and occaſionally practiſed that art in the way of recreation, and merely for the ſake of the pleaſure which he derived from it ; but the pertinacity of his religious zeal having impoveriſhed him, he was obliged to have recourſe to engraving for his ſupport. The ſubjects of his prints are, for the moſt part, taken from the ſacred writings ; and his ſtyle, though ſlight, is original, and the ſeeming reſult rather of intuitive feeling than of acquired knowledge. He worked with the graver alone, in a looſe and open ſtyle, ſo as ſomewhat to reſemble pen and ink drawings.

Coornhaert ſometimes worked in conjunction with Philip and Theodore Galle ; and it is no ſmall addition to his reputation as an artiſt, that he was the inſtructor of Henry Goltzius, of whom we have already treated. An edition of his writings was publiſhed in three folio volumes, 40 years after his death. Whether any complete edition had preceded this, we are unable to ſay.

Our catalogue, which follows, of the works of this extraordinary man, is unfortunately very imperfect. We believe, however, that it includes the moſt favourable ſpecimens of his talents. His plates are generally marked with one or other of the two monograms, which will be found in *Plate* I. of thoſe uſed by the engravers of the Low Countries, " The Deſcent from the Croſs," in large folio, after Lambert Lombard, dated 1556 ; " Joſeph explaining the Dream of his Father, in the preſence of his Brethren," after Hemſkerck, dated 1549 ; the companion to which is " Joſeph explaining the Dreams of the Priſoners before Pharaoh," dated 1549 ; both from the ſame maſter, in 4to. " Job ſcourged by the Devil, and ſcolded by his Wife ;" " Balaam mal-treating his Aſs ;" both in large folio. " The Elector of Saxony defeated at Muhlberg by the Emperor Charles V. ;" and " The Landgrave of Heſſe Caſſel proſtrate before Charles V. ;" all from M. Hemſkerck, of quarto dimenſions.

Mark Guerard, or Gerard, was born at Bruges A.D. 1530, and died in England 1590. He was a proficient in the various arts of engraving, architecture, and painting, both landſcape and hiſtorical. He alſo drew and etched animals with great ſpirit, as is evinced in his fables of Æſop, which are from his own compoſitions ; and in his ſet of eighteen quarto plates of wild and domeſtic quadrupeds.

He likewiſe delineated and engraved a plan of the city of Bruges ; and a ſet of 14 oval prints, of the Paſſion of Chriſt.

Of Criſpin Vanden Broeck, and his daughter Barbara, who flouriſhed about this period, we have already ſpoken. See thoſe articles reſpectively.

Beſide his celebrated *chiaroſcuro* of the Circumciſion, which is particularized in vol. v., Criſpin engraved a ſet of ſeven folio plates of "The Creation of the World," or "The firſt Week," with Latin inſcriptions, beginning "Ex informi omnium;" another ſet from Bible hiſtory, beginning with "Eve eating of the forbidden Fruit," and ending with "The Conſtruction of the Tower of Babel," in nine folio plates; a ſet of nineteen, from "The Life of the Virgin," in folio; a religious emblem, of our Saviour ſeated, whilſt people are occupied in catching the blood that flows from his wounds, in folio; "Jeſus Chriſt on the Croſs, with the Virgin and St. John," in an ornamented border. Both the laſt are marked with the cypher of the artiſt. Four circular ſubjects in *clair-obſcure*, likewiſe marked with his monogram: 1. The Annunciation. 2. The Viſitation. 3. The Adoration of the Shepherds. 4. The Adoration of the Kings: all of which are very rare.

For the cyphers with which Broeck occaſionally inſcribed his performances, ſee *Plate* I. of the monograms of the engravers of the Low Countries.

In a former volume, we have treated at ſome length of the family of De Paſſe, who, by tranſplanting the practice of the Low Countries, contributed to improve our indigenous ſtock of Engliſh engraving. The principal works of Criſpin, the patriarch of that family, are as follows:

Portraits.—Andrea Doria, of Genoa, in ſmall quarto; the elector, Frederic IV. of the ſame ſize, dated 1606; Mary, baroneſs of Rebourſe; Adolphus, baron of Schwarzenberg; Henry Frederic, prince of Naſſau; Henry IV. king of France; Mary of Medicis, queen of Henry IV. all of quarto ſize; Philip II. king of Spain; a buſt of Alexander Farneſe; Axel Owenſtiern, chancellor of Sweden, all of folio ſize; a circular print, in quarto, of Louiſa Julia, counteſs of Naſſau; Henry Cæſarius, juris-conſul, in quarto; Nicholas Fontani, a phyſician, in folio; Charles Niel, a clergyman, of the ſame ſize; Maurice, prince of Orange, on horſeback; Albert, archduke of Auſtria, and Maurice, prince of Naſſau, both on horſeback: in the background of the latter a camp and fortreſs are introduced; both in large folio. Queen Elizabeth ſumptuouſly habited, in quarto, from a picture by Iſaac Oliver; king James I.; Henry, prince of Wales; Charles, prince of Wales, afterwards king of England, both in ovals; Anne of Denmark; ſir Philip Sidney; the earl of Eſſex, on horſeback; Thomas Percy, a celebrated conſpirator, a very rare print; all of quarto ſize. And fifteen plates, entitled "Speculum illuſtrium feminarum."

Hiſtorical Subjects from his own Compoſitions.—"Adam and Eve," wherein a dog is introduced; "The Chaſte Suſannah," inſcribed "Pietas et Caſtitas;" and Cleopatra, inſcribed "Nec Pietas nec Caſtitas," as a companion to the former, both in quarto; "Hercules and Antæus," inſcribed "Vitium ut ſuperas terra altius attollere," in folio; "A Quarrel in the Interior of an Hotel," dated 1589, in folio. Three ſmall circular buſts, repreſenting Faith, Hope, and Charity, very fine engravings. "The Four Evangeliſts," half-length circular prints, in octavo. Twelve plates repreſenting angels variouſly occupied, of the ſame ſize. Another ſet of twelve, of the Sybils, inſcribed "Criſpin de Paſſe, inv. Criſpin, Simon et Magdalen ſc." in folio. "The Seven liberal Arts," and "The Nine Muſes," both in 12mo. A ſet of ſeventeen, intitled "Academia ſive ſpeculum vitæ ſcholaſticæ.—Criſpini Paſſaei, anno 1612." "The Riding Academy of Antonia Pleurinel," in a large folio volume, executed in the beſt manner of Criſpin.

Subjects from various Maſters.—"The Twelve Months of the Year," on ſmall circular plates, from M. de Vos. Six plates, compriſing "The Hiſtory of Tobit," from the ſame painter; "The Four Evangeliſts, with their Attributes," inſcribed, "Geldorpius Gorcius inventor et pinx." in large folio, very fine, and in the ſtyle of Cornelius Cort. "The Annunciation of the Shepherds," from Abraham Bloemart; "Our Saviour on the Croſs, between the Two Thieves," from Jod. de Winghe, both in large folio; "The Judgment of Paris," from Criſpin vanden Broek, in folio; "The Siege of Troy," from the ſame maſter, in large folio; and a ſet of four mountainous landſcapes, with figures, from John Breughel, of folio ſize.

Criſpin de Paſſe, junior, produced but few prints, and hence it has been ſuppoſed that he either died young, or quitted the profeſſion of engraving.

The principal of theſe are the portraits of Frederic, elector palatine, and Johannes Angelius Werdenhagen, both from his own drawings, but the date of the latter, 1630, ſhews that he lived at leaſt to the age of thirty years; and three plates from the Hiſtory of Lazarus. A fourth plate from this hiſtory, which completes the ſet, was engraven by the ſenior de Paſſe.

The works of William, the ſecond ſon, who reſided chiefly in London, were ſomewhat more abundant, but conſiſt chiefly of portraits, among which are thoſe of Robert Dudley, earl of Leiceſter; Robert Devereux, earl of Eſſex, on horſeback; George Villiers, duke of Buckingham, alſo on horſeback; and Frances, ducheſs of Richmond, &c.; all of quarto dimenſions. King James I., with his family, inſcribed "Triumphus Jacobi Regis Auguſtæ qui ipſius ſcrolis;" James I, with prince Henry of Wales; ſir John Haywood, accompanied by emblems; John George, duke of Saxony, alſo with emblematical accompaniments; and ſir Henry Rich, in an oval, are all in folio; and the latter one of the moſt carefully finiſhed engravings of William de Paſſe.

A ſet of the five ſenſes, with each a Latin verſe, in quarto; a family of gypſies, dated 1621, in folio; and a family-piece, ſuppoſed to be that of the palatine, where the youngeſt child is repreſented playing with a rabbit, folio ſize. For the monograms of both theſe artiſts ſee our firſt plate of thoſe uſed by the engravers of the Netherlands.

Simon, the youngeſt of the ſons of Criſpin, reſided alſo for ſome time in England, where he was employed by Hilliard, who was the Reynolds of his day, and of whom Dr. Donne wrote that often-cited paſſage,

> "A hand, an eye, by Hilliard drawn, is worth
> An hiſtorie by a worſe painter made."

For Hilliard, Simon de Paſſe engraved the portraits of moſt of the royal family of England. He was afterwards employed by the king of Denmark, and probably died at Copenhagen. The lateſt of his works executed in England are dated 1613. They chiefly conſiſt of portraits, with ſome few devotional ſubjects and book ornaments; and are marked with his initials combined in a cypher, which will be found in our ſecond plate of thoſe uſed by the engravers of the Netherlands. The principal portraits are thoſe of king James I. and Anne his queen, on horſeback, both in folio; prince Henry and queen Elizabeth, both in quarto; Robert Carr, earl of Somerſet, an oval print, in folio; Frances Howard, counteſs of Somerſet; George Villiers, duke of Buckingham; Francis Manners, earl of Rutland; ſir Walter Raleigh; Thomas, earl of Arundel, from Mirevelt; William, earl of Pembroke, from Van Somer; George, archbiſhop of Canterbury, dated 1616; Accuna, earl of

Condomare, and plenipotentiary to Philip IV.; ſir Thomas Smith, ambaſſador to Ruſſia; Mary Sidney, counteſs of Pembroke; Robert Sidney, earl of Liſle, afterwards earl of Leiceſter; Henry Wriotheſley, earl of Southampton; Lamoral, prince of Gaver, and count of Egmont; Maurice, prince of Orange, all of quarto dimenſions. Four whole length portraits of celebrated dukes of Burgundy, John de Valois, ſurnamed the Intrepid; Philip de Valois, ſurnamed the Hardy; Philip the Good; and Charles the Timid, very rare etchings; the frontiſpiece to the works of the lord chancellor Bacon; a print, entitled “Vanitas vanitatum et omnia vanitas,” with four verſes in the Dutch language. “Our Saviour with the Pilgrims on their way to Emmaus,” in folio; and “A Holy Family,” where the infant Jeſus is repreſented taking a grape from St. Anne, after Baroccio, are alſo from the graver of Simon de Paſſe.

The principal engravings of his ſiſter Madeline we have already noticed in our article on ENGLISH *Engraving*. Her monograms are inſerted in our *Plate* I. of thoſe of the engravers of the Low Countries.

The family of the Galles are more prominent than praiſeworthy in the hiſtory of Flemiſh engraving. Philip, the firſt of that family, was born at Haerlem in the year 1537, but reſided chiefly at Antwerp, where he publiſhed a great number of prints, and where he died in 1612.

Philip underſtood the human figure, handled the graver with facility, and diſcovered a ſhare of talent, that, if brought into action, and kept on the ſtretch, might have advanced the arts of his country; but commerce was the preſiding deity of the Low Countries, and he alone was eſteemed meritorious who became rich. The preſent writer wiſhes he were not ſtruck with too much of reſemblance in this reſpect between the Low Countries at that time, and England at this.

Galle appears to have ſacrificed all deſire of improvement to the rapid production of thoſe ſets of mediocre engravings which from the fountains of Holland and Flanders began about this time to flow over the reſt of Europe; and in effecting this purpoſe he was, unfortunately for the progreſs of art, joined by his own ſons, and by the families of Wierix and Sadeler. Strutt very truly obſerves that in all their works we may trace the ſame ſtiff and formal ſtyle, with little variation, and without any attempt to add taſte and freedom to correctneſs of form, or the ſmalleſt endeavour to enlarge the compaſs, or improve the harmony of chiaroſcuro.

From theſe ſlight engravings of Philip Galle, which for the moſt part are marked with one or other of the monograms, which may be ſeen in our ſecond plate of thoſe of the engravers of the Low Countries, we ſelect the following, as being moſt creditable to his abilities, and leaſt unworthy of the modern portfolio.

A ſet of ſix, of portraits of reformers and other diſtinguiſhed characters of the ſixteenth century, *viz.* Martin Luther, John Calvin, Ulricus Zwinglius, Bilelaldus Pircheymer, Dante, and ſir Thomas More; pedeſtrian ſtatue of the duke of Alva; portraits of Martin Hemſkerck, the painter, and William Philandre, a celebrated architect; all in quarto. A ſet of thirty-four from the life of St. Catherine. A ſet of ſix, in folio, of Sybils, &c. entitled “Jeſu Chriſti dignitatis virtutis et efficientiæ præventus Sybillis X.” after Blockland. The Seven Wonders of the World, in folio; to which, as an eighth, Galle added the Amphitheatre of Veſpaſian at Rome, after M. Hemſkerck. A ſet of ſeven battles, from Stradan; entitled “Mediciæ familiæ geſtarum:” in folio. “Our Saviour travelling with his two Diſciples to Emmaus,” in large quarto, from Breughel; “The Death of St. Anne,” in large folio, from the ſame maſter; “The Holy Trinity,” a grand compoſition, in large folio, from M. de Vos. This is eſteemed the beſt engraving by Philip. “King Solomon ſuperintending the Building of the Temple of Jeruſalem,” from Franc. Floris; “The Sacrifice of Iſaac;” and “Mutius Scævola, in the Tent of Porſenna;” both from the ſame maſter: all in large folio.

Theodore Galle was the eldeſt ſon of Philip, was born at Antwerp A.D. 1560, and having learned from his father the rudiments of engraving, made a journey to Italy, either with the view of improving himſelf in his art, or with that of rendering the profits of the print trade more productive or more ſecure. At Rome he engraved ſeveral plates, but adhered to the ſtyle of his father, though ſurrounded by the fineſt examples of ſuperior art.

After his return to Antwerp, he continued occaſionally to engrave; but print-*ſelling* was with him the buſineſs of life, and he publiſhed the works of other artiſts, as well as his own. His own have the defects of feebleneſs of chiaroſcuro, and ſtiffneſs of ſtyle: yet the following prints from his hand, will ſhew, that in neatneſs he excelled his father, and was a better draftſman.

“Julius Lipſius,” with allegorical accompaniments, explained by ſix Latin verſes; “St. Jerome,” in his cavern, in the act of adoration, both in folio, and of the oval form. A rare and large folio ſet of emblems, entitled “Lites abuſus,” &c. A ſet of ſmall plates from “The Life of St. Norbert.” A ſet of twenty-eight ditto, from “The Life of St. Joſeph, and that of the Virgin Mary.” A ſet of thirteen ditto, entitled “Typus occaſionis in quo recepta commoda, neglecta vero incommoda perſonata ſchemate proponuntur;” (this is from his own deſigns, and is now become ſcarce.) “The youthful Saviour contemplating the Croſs and Inſtruments of his Paſſion;” “St. John the Evangeliſt,” and “St. Jerome,” all of octavo ſize; a folio plate of “Count Ugolino and his Sons impriſoned in the Caſtle of Piſa,” from the Inferno of Dante, after J. Stradan, a rare print; “The Roman Matrons beſeeching Coriolanus to relent;” “Tiber reſting on his Urn, and the Veſtal Tucie receiving Water in a Sieve;” “Cornelia, the mother of the Gracchii, working with her Women,” all of folio ſize. A frontiſpiece, after Rubens, entitled “Aug. Maſcardi, ſilvarum, Lib. IV.;” and another frontiſpiece from Rubens, entitled “Las obras en Verſo de Don Franciſco de Boria;” 1654: both of quarto ſize.

Cornelius Galle, (commonly known by the appellation of the elder Cornelius) was the younger of the ſons of Philip, and was born at Antwerp in the year 1570. He imitated his father's manner of engraving, and followed the ſteps of his brother Theodore, though with far better ſucceſs as an artiſt.

At Rome he reſided a conſiderable time, and acquired there that freedom, taſte, and correctneſs of drawing, which are found in his beſt works, and render them far more eſtimable than thoſe of his relatives. He finally ſettled at Antwerp, and took a ſhare in that conſiderable commerce for prints, which was carried on there by the family of Galle. Among other engravings from his hand, the following will be found more particularly worthy of notice.

Portraits of St. Charles Borromeus, cardinal and archbiſhop of Milan, an octagonal print, in folio; Philip Rubens, father to the celebrated painter, in quarto; John van Havre, and Mother Anne of Jeſus, a Carmelite nun, in folio, both after Rubens; Artus Wolfart, a painter of Antwerp, in large quarto, from Vandyke; Charles I. of England, in an emblematic border, from N. V. Horſt, in large quarto; Henrietta Maria, the queen of Charles I. (ſurrounded by three goddeſſes,) in quarto, from the ſame maſter; St. Antony, in folio; and Leopold William, archduke of Auſtria; of the ſame dimenſions.

Hiſtorical Subjects, after various Maſters.—"Adam and Eve," from John Baptiſta Paggi; "Venus careſſing Cupid," both in large quarto; "The Return into Egypt," a circular plate, in large folio, from the ſame painter; "Jeſus at the Table of Simon the Phariſee," in folio, from L. Civoli; "St. Peter baptizing St. Priſque," from the ſame painter, quarto ſize; "The Virgin and Infant Jeſus, to whom St. Bernard preſents a Laurel Branch and Book," in folio, from F. de Vanni; "Chriſt on the Croſs," at the bottom of which is introduced St. Francis and St. Thereſa, in large folio; likewiſe from Vanni. A landſcape, wherein Venus is repreſented faſtened to a tree, whilſt Minerva ſcourges Cupid, in quarto, from Aug. Caracci; "The Virgin and Child," from Raphael; "The Entombing of Chriſt," in an octagon, quarto, from the ſame maſter; "A Statue of the Holy Virgin," in a niche, around which children are twining garlands of fruit and flowers, from Rubens; "Judith beheading Holofernes," in large folio, a capital print; "The Four Fathers of the Church," in folio, from the ſame painter; this plate was enlarged, but there are impreſſions from it of its original ſize, which are more highly valued by collectors, and which are known by a black ſtreak down either ſide: "Progné diſcovering the Head of his Son and Wife, after he had eaten their Bodies," in large folio; as a companion to "The Rape of Hippodamia," by P. de Bailliu. A naked figure, called "The Colour Grinder," alſo from Bailliu, in folio; and a print, entitled "Romanæ et Græcæ Antiquitatis Monumenta, e priſcis Numiſmatibus erecta per Hubertum Goltzium Antv. 1645."

A dray-horſe never deſcends immediately from the high bred racers of Newmarket: but mental endowments are rarely hereditary. Cornelius Galle, the younger, ſo called in contradiſtinction to the Cornelius of the preceding article, inherited engraving and print-ſelling, but not talent, from his father. He was born at Antwerp A.D. 1600. He was educated under his father, and endeavoured to imitate his ſtyle of engraving. His mechanical execution is ſometimes tolerable, but his drawing very incorrect. Strutt thinks that he may have wanted the opportunity of ſtudying in Italy, as his relations had done: but as thoſe relations had enriched themſelves by trade, it is rather to be inferred that he wanted motive or inclination to travel thither.

The portraits of Cornelius are ſomewhat ſuperior to his hiſtorical works; and the beſt of his portraits are thoſe of the emperor Ferdinand III.; Mary of Auſtria, his conſort; Henrietta of Lorraine; and John Mieſſens, the painter, all in large quarto, and after Vandyke; a folio plate of Jodocus Chriſtophorus Kup de Kupenſtein, (a ſenator of Nuremberg,) after Anſelm van Hulle; and Octavius Piccolomini of Arragon, alſo in folio, with a border of fruit and flowers, after the ſame painter, &c. which latter is probably, on the whole, the beſt print of the younger Cornelius.

From his hiſtorical engravings, the following may be ſelected: "A Nativity, with the Angel appearing to the Shepherds," from D. Teniers; "Venus ſuckling the Loves," from Rubens; "The Deſcent from the Croſs," from Diepenbeck; "The Hoſpitality of Baucis and Philemon," after J. Vanden Hoeck, in folio; "Job abandoned by his Friends and ſcolded by his Wife," after Diepenbeck, in folio; and a quarto plate from "The Life of St. Dominic," after Vanden Hoeck.

Hans or John Bol was born at Mechlin in the year 1534, and died at Amſterdam in 1593. His inclination leading him to the arts, he was inſtructed in painting by a maſter of no great repute, whom he ſoon quitted; and, going to Heidelberg, aſſiſted the progreſs of his own improvement by copying the works of eminent artiſts. His ſubjects are chiefly landſcapes, with animals; but he likewiſe painted hiſtory and miniature with no ſmall ſucceſs. We have by him ſome etchings, in a free ſpirited ſtyle, that indicate the hand of a maſter: theſe he marked with a monogram, which will be found in *Plate* II. of thoſe uſed by the engravers of the Low Countries: and among them are "The Meeting of Jacob and Eſau," a quarto circular print; "The firſt Interview between the Servant of Abraham and Rebecca," of the ſame ſize; "The twelve Months of the Year," circular, in 8vo.; two ſets of landſcapes, views in Holland, in 4to.; and a large print, lengthways, repreſenting an aquatic diverſion in Holland: a man appears in a boat, catching at a gooſe, which is faſtened to a ſtring over the river, and a prodigious number of ſpectators are depicted upon the banks.

Cornelius Cort was born at Hoorn in Holland, A.D. 1536. After having learned the firſt principles of drawing and engraving, (as Strutt conjectures, from Coornhaert,) he worked for a time as the aſſiſtant of Jerome Cock, and afterwards travelled to Italy to complete his ſtudies.

At Venice, where he was courteouſly received by Titian, he made a long ſtay: ſome ſay he reſided in the houſe of Titian. However this may have been, he engraved from ſeveral of the pictures of that much admired artiſt, and no doubt profited by his inſtruction and advice.

That his mind expanded in this genial climate of art, where Titian ſhone forth, there is indeed abundant proof to be obtained, by comparing his engravings after that maſter with thoſe frigid works after Hemſkerck, which he produced under the influence of Germany and Jerome Cock.

He began now to engrave larger plates, in a bolder and broader ſtyle than that to which he had hitherto been accuſtomed; and removing to Rome, eſtabliſhed there an academy of engraving, in which ſeveral meritorious pupils (among whom was Agoſtino Caracci) liſtened with advantage to his inſtructions, and imitated his example with ſo much ſucceſs, that Cort may with juſtice be reckoned among thoſe men of genius who have contributed to the enlargement of the boundaries of the art itſelf. But the career of our artiſt, though brilliant, was ſhort: he died at Rome, in the meridian of his reputation, at the age of two-and-forty.

Cort worked with the graver only, in a bold and manly ſtyle: his drawing, though ſometimes neglected, is generally correct; and his chiaroſcuro improves upon that of his predeceſſors. Even in the careleſs paſſages of his works, ſo much taſte and freedom prevail, and ſo many indications of ſound knowledge, that his negligence muſt ever be eſteemed the negligence of haſte, and of a too eaſy reliance upon the friendſhip of the ſpectator, which he believes he has conciliated: not that of ignorance.

Baſſan, in eſtimating his merit, praiſes with juſtice the taſte and lightneſs of touch with which he engraved landſcape, without the aſſiſtance of etching; and adds, that "he was the beſt engraver with the burin, or graver alone, that Holland ever produced:" an encomium which our countryman, Strutt, thinks may be a little overſtrained.

His print of "Chriſt praying in the Garden," which is probably engraven from his own compoſition, is marked with a ſmall inſtrument, or utenſil, near the feet of one of the diſciples, which is uſually taken for a lamp, and has ſometimes been miſtakenly attributed to an old maſter who flouriſhed in 1509. On other occaſions, according to Strutt, he marked his prints with the two ſmall fighting cocks, which we have copied in *Plate* II. of the marks, &c. uſed by the engravers of the Low Countries; though for what reaſon cannot eaſily be imagined, as he was not a Frenchman, unleſs it were to denote that theſe engravings were performed by Jerome Cock and himſelf in conjunction.

The abbé Marolles poſſeſſed upwards of one hundred and fifty engravings by this maſter. Of theſe we are able to enumerate the following, beginning with his

Portraits.—Cornelius Cort, engraved by himſelf, in a quarto oval; a pair of Henricus II. Gallorum rex, and Catherine de Medicis, the French queen, in ovals of large quarto ſize; Don Juan of Auſtria; Marc Antonius Moretus, a Roman citizen; Andrea Alciati, all in ovals; three portraits engraved for J. Cock, *viz.* Roger of Bruſſels, Theodore van Harlem, and Joachim Dionatinſis, all artiſts; the genealogical tree of the illuſtrious family of Medicis, with the portrait of Scipio Amirato; the genealogical tree of the family of Cambi Importuni; and two buſts of Democritus and Heraclitus, in 12mo.

Subjects from his own Compoſitions.—“The Birth of the Holy Virgin,” in folio, dated 1568; “The miraculous Conception,” wherein the Virgin Mary is ſurrounded by allegorical devices, dated 1567; “The Infant Jeſus in the Temple;” “A Repoſe during the Flight into Egypt,” 1568; “A Holy Family,” wherein St. Joſeph is repreſented giving a pear to the infant Chriſt; “The Laſt Supper;” “A Crucifix,” ſupported by two angels, whilſt others are diſplaying the tablets of the law, and a chalice; “The Reſurrection of our Saviour;” “St. Theodore the Patron Saint of Venice, fighting with a Dragon;” “St. Catherine kneeling on the Inſtruments of her Martyrdom, crowned by two Angels;” “St. Verediana, a Virgin, kneeling before an Altar, with a Serpent at her Feet,” 1570; two tempeſtuous ſea-pieces; a frontiſpiece, repreſenting the Virgin ſeated between two chemiſts; “A Fawn placing a young Bacchus in a Niche;” “A Soldier carrying an Infant;” and “A young Man ſeated, drawing a Thorn from his Foot,” all of folio dimenſions.

Subjects engraved from various Flemiſh Maſters, before Cort went to Italy.—“Adam and Eve;” they are ſeated under the tree of life, whilſt a ſerpent, with a human head, preſents an apple to Eve, from Michael Coxie; “The Reſurrection of Chriſt;” “The Deſcent of the Holy Ghoſt;” “Our Saviour accompanied by Sts. Peter and Paul,” all of folio ſize, from Michael Coxie; a ſeries of four folio plates, from the parable of “Dives and Lazarus,” after Hemſkerck; another ſeries of four, from the parable of “The good Servant;” and the parable of “The Vineyard,” all from the ſame painter, in folio; a ſet of ſix, in folio, from “The Hiſtory of Noah,” from Franc. Floris; “The Hiſtory of Abraham,” in a ſet of the ſame number; “The Hiſtory of Jacob and Rachael,” engraved on ſix plates in the form of a fan; “The Labours of Hercules,” in ten folio plates; “The Hiſtory of Pluto and Proſerpine,” in four plates of folio ſize; “The Triumph of Bacchus and Venus,” all from the ſame; an emblematical ſubject on the immortality of virtue, after Franc. Floris, both in large folio; “The Deſcent from the Croſs,” after Van der Wyde, in folio; a ſtanding figure of St. Roch, from J. Speckart; and St. Lawrence, from the ſame painter: “St. Dominic reading,” from B. Spranger; “A Holy Family, ſurrounded with Angels,” from the ſame; “The Virgin crowned in Heaven,” after G. Moſtaert; and “The Painting Academy,” after Stradan, all of folio dimenſions.

Subjects engraved in Italy from various great Maſters. 1. *From Titian.*—“The Annunciation,” in large folio; “The Martyrdom of St. Lawrence,” of the ſame ſize; another “Annunciation,” in folio; “The Holy Trinity,” known by the appellation of “the All-powerful,” in large folio; “St Jerome reading,” in folio; another folio plate of “St. Jerome, at the Entrance of his Cell, proſtrate before a Crucifix,” a very rare print, omitted in Heinneken's catalogue of the works of Cort: a half figure of “A Magdalen;” another “Magdalen in the Deſart, before a Crucifix;” “Tarquin and Lucretia,” folio ſize; “Diana and Caliſta,” large folio; “Prometheus chained to the Rock;” and “Rinaldo delivering Angelica from the Dragon,” both in large folio.

From Jerom Mutian.—“St. Peter walking on the Sea;” “Chriſt crowned with Thorns;” “Chriſt bearing the Croſs;” “The Deſcent from the Croſs;” “Jeſus Chriſt appearing to the three Maries, and St. John, on their way to Jeruſalem;” another “Deſcent from the Croſs;” “St. Jerom meditating;” all of folio dimenſions; and “The ſeven Penitents.” Theſe are large landſcapes, in which are introduced ſmall figures of the ſaints, Mary Magdalen, Jerome, John the Baptiſt, Hubert, Onophrom, Francis (ſtigmatiſed), and Francis (in extacy): ſix of them are upright plates, and the ſeventh lengthways.

From Julio Clovio.—“The Annunciation;” “The Adoration of the Kings;” a half figure of “The Virgin holding the Infant Jeſus;” and “The youthful Jeſus preaching in the Temple;” all in folio. “Jeſus baptiſed by St. John in the River Jordan;” and “The Crucifixion,” both in large folio; “The dead Body of our Saviour, and one of the Maries kiſſing his Hand;” “The Entombing of Chriſt,” in folio; “Chriſt appearing to Mary Magdalen,” of the ſame ſize; “The Converſion of St. Paul;” “Chriſt on the Croſs,” a grand compoſition, both in large folio; and “St. George and the Dragon,” in folio.

From Taddeo Zuccaro.—“The Creation of Adam and Eve,” in large folio; “The youthful Virgin preſented in the Temple,” in folio; a large folio plate of “The Nativity,” a rich compoſition; “A Holy Family,” wherein St. John holds a lamb; “The Miracle of the five Loaves,” both in folio; “The Body of our Saviour before the Sepulchre,” a grand compoſition; “The Deſcent of the Holy Ghoſt,” both of large folio dimenſions; and a folio print of “The Martyrdom of St. Agatha.”

After Frederic Zuccaro.—“Moſes and Aaron before Pharoah;” “The Birth of the Virgin;” and “The Conception of the Virgin,” who is ſupported and crowned by angels; “The Annunciation of the Virgin;” “The Nativity,” a grand compoſition, all in large folio; “The Adoration of the Magi;” “A Holy Family,” where a cat is introduced catching a bird; “The Flight into Egypt;” “Our Saviour tempted in the Wilderneſs;” “The Woman taken in Adultery;” “Jeſus turning the Money-Changers out of the Temple;” “The Reſurrection of Lazarus;” “The good Samaritan;” “St. Peter choſen Head of the Church;” “Our Saviour on the Mount of Olives;” “The Jews approaching our Saviour in the Garden of Olives;” “The Death of the Virgin;” “The Coronation of the Virgin;” “St. Lawrence and St. Sixtus,” ſurrounded with an ornamental border, all of folio dimenſions; “The Diſpute of the Holy Sacrament,” in large folio; “Labour and Juſtice,” an emblematical ſubject, in folio. A large ſatirical print on the officers of pope Gregory XIII., repreſenting a young man accuſed by Calumny and protected by Innocence, before a judge, with the ears of an aſs, (the whole of which is taken from Lucian's deſcription of a loſt picture, by Apelles): and another ſatirical print engraved on two large plates; in the lower part of the compoſition is introduced a painter ſitting at his eaſel, painting the portraits of certain celebrated ſimpletons of the day: in the upper part ſits Jupiter on his throne, ſurrounded by all the gods, protecting the arts and ſciences; a very capital and rare print.

From Raphael d'Urbino.—"The Transfiguration," from the celebrated picture in the Vatican; "The Conteſt between the Romans and Pyrrhus," known under the appellation of "The Battle of the Elephants," both of large folio ſize. A large print, executed on three ſeparate plates, of "The Victory of Conſtantine over the Emperor Maxentius, at Ponte-Molle." Cort left this plate unfiniſhed at his death, but it was afterwards completed by Ph. Thomaſſin.

Subjects from various other Italian Maſters.—"Mount Parnaſſus," a folio print, from Polidore; "The Adoration of the Shepherds," in large folio, from the ſame maſter; "A Repoſe during the Flight into Egypt," in folio, after B. Baſſaro; an unfiniſhed print, in folio, of "The Apotheoſis of St. Jerom," from the ſame maſter; "The Viſitation of St. Elizabeth," a large folio print, from Marc of Sienna; "The Adoration of the Shepherds," a folio print, from the ſame maſter; another of "The Adoration of the Shepherds," from Paris Romano; "The Virgin ſitting near a Fountain, with the Holy Infant, and St. John," in folio, from F. Baroccio; a folio print of the "Baptiſm of our Saviour," after F. Salviati; "The Marriage of Cana," from Lorenzo Sabbatini, in folio; "The Laſt Supper," after L. Agreſti Forlivetano (there are impreſſions of this plate both with and without the mark of Cort), in large folio; "St. Stephen ſtoned," in large folio, from Marcellus Venuſtus; "St. Jerome before a Crucifix," after Riccio da Sienna, in folio; "St. Jerom, attended by two Angels," from Jacobus Parmenſis, in folio; "The Girdle of St. Francis," after Caracci, in large folio; a quarto print of "The Marriage of St. Catherine;" a folio print of "St. Margaret of Cortona," from Tempeſta; "A Dance of Dryades," in folio, from Maitre Rous, of Florence; "The three Deſtinies," from Julio Romano, in folio; and "The Tombs of the Dukes of Mantua," in large folio, after Michael Angelo.

Of Philip de Sorge, Sericcus, or Sytius, very little is known. Strutt ſpeaks of the few prints which we ſhall venture to aſcribe to him, as being the production of two artiſts: Roſt and Huber are more probably in the right, in aſcribing them to one. Sericcus ſtudied under Cornelius Cort, and afterwards ſettled at Rome, where it is probable, from the ſcarcity of his works, he died at an early period of life; but neither the time of his deceaſe, nor that of his birth, have been mentioned.

His ſtyle of engraving, evidently formed upon that which we may term the Italian ſtyle of Cort, is open, vigorous, and free; but his knowledge of the figure was inferior to that of his maſter, and his chiaroſcuro, though not diſcordant, not very forcible.

We are acquainted with no other of his works than a ſet of twenty-eight half-length figures of the popes in chronologic ſucceſſion, from the year 204 to 1568, the year in which they were publiſhed; they are in ſmall folio, and executed with the graver only, in a ſtiff, ſlight manner. Pope Pius V. ſurrounded with emblematical figures, deſigned by Sericcus himſelf, and engraved in a ſtyle ſuperior to the former. "Judith beheading Holofernes," in folio, after Julio Clovio; "The Angel warning St. Joſeph to depart into Egypt," from C. Cort, of the ſame ſize as the original; "St. Francis receiving the Stigmatics," in large folio; "St. Jerome before a Crucifix in the Deſart," ſuppoſed to be from Mutian, in large folio; "The Virgin and Infant Chriſt," known by the appellation of "The Virgin of Silence," inſcribed "Dormiente puero Jeſu divina Mens vigilat," with the name of Philip Sericcus, dated 1566, in large folio; a large folio print of "Our Saviour on the Croſs," with the Virgin and St. John the Evangeliſt, on either ſide at the foot of the croſs, after Michael Angelo; and a large folio print, which is attributed to Soye, although it bears the name of Cort, repreſenting "Prometheus chained to a Rock," from Titian's picture in the royal palace at Madrid.

John Ditmer, or Ditmar, was a native of the Low Countries, and born in the year 1538, or thereabouts. By this engraver we have a middling-ſized upright plate, nearly ſquare, repreſenting a figure of Chriſt ſeated on the clouds, with the ſymbolical animals, ſeen in viſion by the prophet Ezekiel, and which are the uſual attendants on the evangeliſts, and angels bearing the croſs, crown of thorns, &c. It is executed in a ſtyle greatly reſembling that of Cort, but coarſer, and by no means ſo well drawn as the works of that maſter generally are. This print is after Michael Coxie, and is dated in the year 1574, nor are we able to ſpecify more of the works of this engraver, who was apparently inſtructed in his art by Cornelius Cort.

Gerard de Jode was born at Antwerp in the year 1521, and died in the ſame city A.D. 1591. He was celebrated both as an engraver and geometrician, and was the ſon of Cornelius de Jode, a well-known geographer. Part of his youth was paſſed in the ſervice of the emperor Charles V., after which he gave up his attention entirely to the arts and ſciences. He engraved ſome geographical, and a great number of hiſtorical, plates, in the ſtyle of his contemporaries and countrymen, Wierix and the Collaerts, and Papillon ſays that he executed ſome meritorious engravings on wood.

He likewiſe eſtabliſhed at Antwerp a printſeller's ſhop, which, after his death, was carried on by his widow. Being hereditarily known as a geographer, in which ſcience he excelled, he was much encouraged by Ortelius, who was ſurnamed the Ptolemy of his age, and of whom we have ſpoken under the article ENGLISH *Engraving*. The principal works of Gerard de Jode, are a ſet of twenty-nine, of the portraits of the popes, in 4to. publiſhed in the year 1585. A Roman triumph, on twelve plates, after Hemſkerck, in 4to. A ſet of thirteen, intitled "Memorabilium, novi Teſtamenti, templo Geſtorum Icones tredecim elegantiſſimi ac ornatiſſimi. Antwerpia excudebat Gerard de Jode," in folio, with architectural back-ground, and a very large and well engraved print, executed on three plates of "The Crucifixion," after Michael Angelo.

Peter de Jode, the elder, was born at Antwerp A. D. 1570, and died in the ſame city in 1634. He was the ſon of the preceding artiſt, who inſtructed him in the knowledge of geometry and drawing, but he ſtudied engraving under Henry Goltzius, and afterwards travelled to Italy and to Paris, to improve his connections and complete his profeſſional ſtudies. In Paris he remained ſome time, and with the aſſiſtance of his ſon, executed ſeveral plates there, which were publiſhed by A. Bonenfant. He returned to Antwerp a few years after the commencement of the ſucceeding century, where he remained till the time of his death.

The engravings of the elder Peter poſſeſs great merit. He was an excellent draftſman; his chiaro-ſcuro is not inferior to that of the age in which he lived; and in his manual execution he uſed the graver alone, in a manner evidently founded on the neater ſtyle of Goltzius, but not with equal freedom, nor equal power of expreſſing the variety of ſubſtances which entered into the compoſitions from which his prints are engraven.

He engraved both portraits and hiſtory with ſucceſs, but did not excel in landſcape. From the whole of his works, which are ſomewhat numerous, the connoiſſeur may ſelect the following with advantage.

The *Portraits* of Henry du Puy, a Dutch philoſopher, in a circle ſurrounded by a ſerpent, in 4to.; John Boccacio, from Titian, in folio; Ferdinand, count palatine of the Rhine, in an oval, from Rubens, quarto ſize; Philip III., king of Spain, in an oval, from Rubens; Francis de Mello, count of Azumar; Ambroſe Spinola, ſurnamed the Great General, all of quarto dimenſions.

Hiſtorical, &c.—"The Virgin and Child," from Titian; "The Marriage of St. Catherine," both in quarto. A large folio print of a "Holy Family," in a mountainous landſcape, both from the ſame painter. Twelve prints of "The Life and Miracles of St. Catherine of Sienna," after Francis Vanni, in folio; "The Adoration of the Shepherds," likewiſe in folio; "Chriſt at the Houſe of Nicodemus," a night-piece, in large quarto; "The Decollation of St. John," in an oval, of octavo ſize, a rare print, from Rubens; "Our Saviour delivering the Keys to St. Peter," in folio; "The Coronation of St. Catherine," in folio. An allegorical ſubject of government, repreſented by a female crowning Prudence with a laurel wreath, in 4to. Another, of "The Five Senſes," in folio. The frontiſpiece to a book, intitled "Annals of Flanders," by M. Sueiro, repreſenting Flanders, perſonified, leaning on a pedeſtal, &c. &c. in folio, all from Rubens. Thirty-ſix prints in quarto, from the "The Life of Chriſt;" and "The Laſt Judgment," after a picture by John Couſin, in the church of the Minims at Vincennes. The painter has introduced his own portrait at the left hand ſide of the print. This is one of the largeſt prints in exiſtence, being engraved on twelve plates!

Peter de Jode, the younger, the ſon of him who is the ſubject of the preceding article, was born at Antwerp, according to Strutt and the foreign authorities, in the year 1606. He ſtudied under his father, whom he ſurpaſſed in taſte and facility of handling the graver, though he can ſcarcely be ſaid to have equalled him in the drawing of the naked. Our countryman, Strutt, though generally not deficient in accuracy of notice, has contributed to confuſe the chronology of this artiſt and his father. He ſays, "it does not appear that the younger de Jode went to Italy, but he certainly accompanied his father to Paris, where they engraved conjointly a conſiderable number of plates for M. Bonefant, and le Sieur l'Imago," which, if our author's report of the return of the elder de Jode from Paris might be credited, is making the ſon travel to Paris and engrave, before he was born; for Strutt, in his account of the father, expreſsly ſays, "he returned to Antwerp about the year 1601, where he reſided till the time of his death."

Perhaps the ſenior de Jode returned from his firſt journey in 1601, and afterward, as he did not die till 1634, made a ſecond journey to Paris, taking with him his ſon.

The prints of the junior de Jode are numerous, but very unequal in merit. Baſſan ſays of him, that in ſeveral of his engravings "he has equalled the beſt engravers, and in others has ſunk below himſelf." To which Strutt juſtly adds, "he was, without doubt, a very able engraver, but to place him (even in his beſt exertions) upon an equality with his contemporaries, Bolſwert, Pontius, and Vorſterman, is, in my opinion, eſtimating his abilities at much too high a rate."

Among his moſt eſteemed performances may be mentioned the following

Portraits of celebrated artiſts, &c. after the pictures of Vandyke, of ſmall folio ſize. Peter de Jode, junior, engraved by himſelf; James Jordaëns, painter of Antwerp; Cornelius Pœlenbourg, painter, of Utrecht; John Smellineux, painter, of Antwerp (the fleſh of which is etched); Adam Coſter; Andrew Colyns de Nolo, a ſtatuary of Antwerp; Genevieve d'Urphe, the widow of Charles Alexander, duke of Croye; Jane de Blois; Henry Liberti, an organiſt; John Tzerilaës, count of Tilly; Albert, duke of Friedland, and count of Wallenſtein; Diodorus de Tulden, profeſſor at Louvain; Antonio Trieſt, biſhop of Ghent; Charles Henri, baron of Metternich, in an ornamental border; Auguſtus Adolphus, baron of Trantorf, ſurrounded with an ornamental border, all of folio ſize; Thomas Ricciardi; Simon Vouet del, in 4to.; Erneſt, count of Iſembourg, chevalier of the golden fleece, a half-length portrait, in armour, after Th. Willeboorts, in 4to.; and a folio print, entitled "Petrus de Francavilla, Gall. Regiſ. Architect et Sculptor," after J. Bunel.

Hiſtorical Subjects.—"St. Auguſtine," biſhop of Hippona, crowned by Religion, with other acceſſory emblems, in folio; "St. Francis kneeling before a Crucifix," after Baroccio, in folio; "A Holy Family," where Elizabeth, St. John, and Zacharias, are explaining a book held by an angel, in large folio, from Titian; "An Emblem of Death," repreſented by an infant ſleeping upon the ground, with a ſkull lying by his ſide, a ſmall plate, lengthways, from Artemiſa Gentileſca; "The Viſitation of the Virgin," from a picture by Rubens, in the cathedral at Antwerp, in large folio, a very fine and rare print. A fine print of "The Three Graces," in large folio; "Venus riſing from the Sea," ſurrounded by nymphs and tritons, in large folio; "The Alliance of the Earth and Sea," perſonified by Cybele and Neptune, a plate of folio ſize, as a companion to that of "Plenty," by Theodore van Keſſel, all after Rubens; "St. Francis and St. Clara, worſhipping the Infant Chriſt, lying in the Manger," half figures, with the effect of night, in folio, after G. Seghers, the companion to which is "St. Peter denying Chriſt," engraven by And. de Paulis; "Chriſt diſcourſing with Nicodemus," half figures, with the effect of night, from the ſame painter; "The Nativity," from Jordaëns, a very fine and rare print, in large folio; "St. Martin of Tours expelling the evil Spirit from a Demoniac," very large folio; "Folly and Ignorance," half figures, a large folio plate, all from Jordaëns; "St. Auguſtin ſurrounded by Angels," a large circular plate, after Vandyke; "Rinaldo and Armida," a large folio plate, from the ſame maſter, being the companion to another plate, which Baillieu engraved after the ſame painter; "A Holy Family," where the infant Chriſt is held by St. Anne, after Abr. van Diepenbeck. An allegorical ſubject of "Peace," and "St. John the Baptiſt in the Deſart," from Van Mol, all large upright plates.

Arnold de Jode, the ſon of Peter de Jode the younger, was born at Antwerp in the year 1636, and was inſtructed by his father in the art of engraving. In his youth he migrated to England, but being no great proficient in his art, was not able to contribute much to the advancement of Engliſh engraving, though the art in this country was then at a low ebb.

He reſided here at the time of the great fire of London, as may be learned from an inſcription beneath his print of "The Infants Chriſt and St. John embracing each other," after Vandyke, which runs thus, "Arnoldus de Jode, ſculp. Londini, tempore incendii maximi." It may be worthy of note, that this engraving is dedicated to ſir Peter Lely, who was at that time the poſſeſſor of Vandyke's picture.

It ſeems not improbable, that the low ſtate of Engliſh taſte, and paucity of artiſts at that period, enabled Arnold to live with more profit and conſequent comfort in this country than in his own, for his talents were very indifferent, and by no means commenſurate to his early opportunities of acquiring profeſſional information.

It may be ſufficient to mention the following prints from his graver, of which the portraits will, generally ſpeaking, be found the beſt.

The *Portraits* of ſir Peter Lely, in large folio, from a picture by ſir Peter himſelf; Alexander Browne, (prefixed to his Ars Pictoria,) in ſmall folio, from J. Huyſmans; Catherine Howard, ducheſs of Lenox, &c. in folio, after Vandyke; cardinal Palavicini, in 4to. after Titian.

Hiſtorical, &c.—"Mercury inſtructing Cupid," in ſmall folio, from Correggio, engraved in London, and dated 1667; "A Magdalen," a half-length figure from Vandyke. The folio print after Vandyke, mentioned in his biography above; and a landſcape after L. de Vadder, in folio.

In the ſixteenth century, the orthography of proper names, as well as that of words, appears to have been extremely unſettled. On the continent, as well as in this iſland, men ſpelled variouſly, as they variouſly eſtimated the powers of letters, and Printing was as yet too young to have erected a ſtandard.

John Wierix, Wierx, Wierinx, or Wirings, (for thus capriciouſly has the orthography of this name varied from itſelf,) was born at Amſterdam, in the year 1550. His love for the arts appears to have manifeſted itſelf at a very early period of his life. We know not from whom he learned the firſt principles of drawing and engraving; perhaps he owed them, as well as his ſubſequent progreſs, principally to his own application and patient induſtry. He ſtudied the works of Albert Durer very attentively, and built his taſte upon them; but from too cloſe and ſervile a mode of copying them, he contracted a ſtiffneſs, of which he never diveſted himſelf. There is little or no originality in his prints. His genius ſeems to have been confined, and he was fearful of venturing beyond the bounds of a copyiſt. The incomparable neatneſs of his works executed with the graver only, gives them, however, a value with the curious collector, which is encreaſed by the correctneſs of his drawing, and the manner in which the extremities of his figures are marked, proves the great attention he muſt have paid to that part of his profeſſion. His works are exceedingly multifarious, conſiſting of devotional ſubjects of various kinds and ſizes; from which the following may be ſelected as affording, on the whole, the moſt ſatisfactory ſpecimens of his abilities.

Portraits of Rodolpho II. emperor of Germany; Philip William, prince of Orange, in 4to; Eleanor of Bourbon, princeſs of Orange; James I. of England, with his queen, whole lengths, a ſmall upright plate, very ſcarce; Philip II. of Spain; Catherine of Medicis, wife of Henry II.; Henry III. of France; and the counteſs of Verneuil, all of quarto dimenſions; the laſt is a companion to the portrait of Henry IV. engraven by Goltzius.

Subjects from his own Compoſitions.—A ſmall print of "Chriſt and the Virgin;" "The Reſurrection," in octavo; "The Jeſuit Martyrs," in 4to. with an explanation; an allegorical ſubject, called "The Penitent Heart," with Dutch inſcriptions; "The Magdalen," at the entrance of a cell, reading before a crucifix, a very beautifully finiſhed print, both of quarto dimenſions; an allegorical print, called "The Redemption of Man," in folio; and "The four Elements," of the ſame ſize.

Subjects from various Maſters.—A ſmall Satyr, from Albert Durer, engraven by Wierix at the early age of twelve, in 12mo; "Adam receiving the forbidden Fruit from Eve;" a ſmall upright plate, laboriouſly copied from the celebrated print of the ſame ſubject by Albert Durer. It is dated 1566, and Weirix has added his own age, which was only ſixteen; "St. Hubert at the Chace, proſtrate before a Crucifix," a very fine copy from Albert Durer, (whoſe cypher it bears,) in large folio; "St. Jerom in Meditation," a very good copy, done at the age of thirteen, in folio; "The Marriage of St. Catherine," after Dennis Calvaert, in quarto; "The Sacrifice of Iſaac," from M. de Vos; "Elias tranſlated to Heaven;" "Chriſt taken from the Croſs," after Otho Vænius; "The Laſt Judgment," from Michael Angelo, a fine copy from the print by Martin Rota; and another "Dead Chriſt," after Bernardino Paſſeri, all of folio dimenſions.

Hieronymus or Jerome Wierix, was alſo born at Amſterdam in the year 1551, and is believed to have been the brother of John, of whom he learned the principles of drawing and engraving, and imitated his ſtyle with ſo much preciſion, that it would be a matter of the utmoſt difficulty to diſtinguiſh the works of the one from thoſe of the other, were it not for the marks with which they are inſcribed. The prints of Jerom poſſeſs the ſame extraordinary neatneſs, which we admire in thoſe of John, are as correctly drawn, equally deficient in taſte and freedom, and equally the reſult of careful labour.

Jerom Wierix marked his plates with his initials, or a monogram, which will be found in our ſecond plate of thoſe uſed by the engravers of the Low Countries. His works are ſtill more numerous than thoſe of his elder brother; and thoſe moſt worthy of eſteem, are the following.

Portraits of the emperor Charlemagne, in octavo, decorated with imperial ornaments; Henry of Bourbon, king of Navarre; queen Elizabeth of England; Sigiſmond III. of Poland; Alexander Farneſe, duke of Parma; and ſir Francis Drake, all of very ſmall ſize; John Coropi Becani, a phyſician, holding a ſkull, in folio; De Conſtain, and G. Oberſchie Delpheus, alſo in folio.

Subjects from his own Compoſitions.—"St. Francis," in 12mo.; "St. Cecilia," in quarto; "St. Anthony, held by the Devil," in 12mo.; "St. Bruno," in octavo; "St. Charles Borromeus," of the ſame ſize; "St. Anthony and St. Francis, to whom the Virgin preſents the Infant Chriſt;" "The Holy Virgin ſuckling the Infant Jeſus;" "The Virgin ſtanding on a Creſcent, with the Holy Infant ſurrounded with Rays of Glory," both in 12mo.; "The Miraculous Conception;" "The Death of Lucretia;" "The four Monarchies of the World," on four quarto plates; "Chriſt on the Croſs ſuſpended from a Vine, ſurrounded by four Saints," all of quarto ſize; another "Chriſt on the Croſs, in the midſt of a Vine, ſurrounded with Rays of Glory," the crucifix is ſupported on a bunch of grapes, which is held by the two Iſraelitiſh ſpies of the bible, an odd conceit, in 8vo.

Subjects from various Maſters.—"A dead Chriſt, ſupported upon the Lap of the Virgin," after John Mabuſe; "Chriſt receiving little Children," from Criſpin van den Broeck; "Chriſt on the Croſs," at the bottom of which is introduced the king David, St. Paul, and St. John the Baptiſt, after the ſame maſter; "A Holy Family," where St. Catherine

therine is introduced kiſſing the feet of the infant Jeſus, after Dennis Calvaert; "The Death of the Virgin," from Otho-Vænius; "Chriſt at the Table of Simon the Phariſee," after the ſame painter, all of folio dimenſions; "Death and Satan," combating for a tree, while a ſaint and the holy Virgin are imploring Jeſus Chriſt to preſerve it, after H. van Balen, in octavo; "The Globe of the Earth near its Deſtruction, upheld by Jeſus Chriſt and the Virgin," in octavo; "The oppoſite Roads to Heaven, and to the Infernal Regions," in quarto, from the ſame painter; "Our Saviour crowned with Thorns," after G. Moſtaert, in folio; "Jeſus Chriſt on the Croſs, worſhipped by two Angels, in the Clouds," on one ſide of the croſs is introduced the Virgin, and on the other St. John, whilſt the Magdalen embraces the croſs; (this is eſteemed the fineſt print from the graver of Jerom;) "Enoch tranſlated to Heaven," after M. de Vos, in folio; "The Death-bed of the Juſt," in large folio, from Amb. Franck; "Jeſus baptiſed by John," after H. Hondius, in folio, a fine engraving; "The Viſions of Daniel," after Van Haecht, in quarto; "Jupiter deſcending to Danae, in a Shower of Gold," from the ſame painter: a very capital print, after Lucas Romanus, of "The Reſurrection of Chriſt," in large folio; and another, from the ſame painter, of "The Scourging of Chriſt," which Strutt pronounces one of his largeſt and beſt engravings, though not ſo neat as his other works.

Antony Wierix was the younger brother of Jerome and John, and, in general, adopted the ſame neat and laboured ſtyle of engraving, eſpecially when he worked upon ſmall ſubjects; but ſome of his larger prints are executed with more freedom; which, of courſe, adds greatly to their intereſt, in the eſtimation of perſons of taſte. Antony drew as correctly as his brother, and employed his graver upon the ſame ſort of ſubjects; often indeed working conjointly with Jerome. We ſhall mention the following

Portraits, (all of which are very ſmall,) pope Clement VII.; Philip Emanuel, of Lorrain, duke of Mercœur; Iſabella, of Auſtria, daughter of Philip II. of Spain; Robert Bellarmin, cardinal; and Albert of Auſtria, archbiſhop of Toledo, and governor of the Low Countries, in quarto.

Subjects from his own Compoſitions.—Saints "Thereſa," in octavo; and "Sebaſtian," in folio; "St. Dominic receiving a Roſary from the Holy Virgin;" "The Virgin Mary;" and "The Marriage of St. Catherine," both in 12mo.; "The Litany of the Virgin," in eight leaves, of octavo ſize; "The Virgin and Child, to whom the eternal Father diſplays the Inſtruments of the Paſſion," in 12mo.; "The purified Souls," with French and Latin verſes, in octavo; "Chriſt ſurrounded with the Repreſentations of the Sufferings of various Martyrs," in quarto; "The Emblems of future Rewards and Puniſhments," in octavo; and "St. Jerom praying, accompanied by two Angels," in quarto; one of the beſt engravings by Antony Wierix.

Engravings from various Painters.—"Abraham ſacrificing Iſaac," and "The Adoration of the Kings," both in folio, and from M. de Vos. Four plates in quarto, repreſenting the Hiſtory of the prophet Jonas. "Reſignation," perſonified by a female, faſtened to a rock, holding a crucifix, while an angel crowns her with laurel, from J. de Backer, in folio; "A Repoſe during the Flight into Egypt," where St. Joſeph is repreſented holding a bunch of grapes, after Cam. Procacini, in folio, executed in a bold broad ſtyle; "The Death of St. Francis," in folio, from the ſame painter; and "The Life of Chriſt," to which is added "The Death and Aſſumption of the Virgin Mary," with explanations, forming a ſet of fifty-nine prints in folio, engraved conjointly by the three brothers, John, Jerom, and Antony.

Abraham de Bruyn, or Brun, was born at Antwerp in the year 1540; and eſtabliſhed at Cologn. On account of the ſmallneſs of his productions he has been ranked in that claſs of artiſts, which is diſtinguiſhed by the appellation of the *little maſters,* and ſeems hardly to have merited even the diſtinction which he attained; for his prints are evidently rather the productions of labour and aſſiduity, than of genius. The lights in them are ſcattered and unharmonized, which deſtroy the effect, and give them a cold, metallic appearance, and his drawing is incorrect. It is true, Rembrandt had not yet dawned, and inattention to the chiaroſcuro has been termed by the apologiſts of ſuch artiſts as Bruyn, "rather the fault of the age, than the profeſſor;" and notwithſtanding theſe defects, the works of this artiſt are much ſought after by connoiſſeurs. The two monograms, which he affixed to his prints, will be found in our ſecond plate of thoſe uſed by the engravers of the Low Countries; and his beſt engravings are entitled as follows:

Portraits of the elector palatine, Philip Louis, and Ann his wife; Albert Frederick, duke of Pruſſia; William, duke of Juliers, and Mary his ducheſs; John Sambucus, phyſician (a wood engraving); "Carolus nonus Francorum Rex;" and Anne of Auſtria.

Hiſtorical, &c.—"Moſes and the burning Buſh," in quarto; "The Four Evangeliſts," "Chriſt and the Woman of Samaria," and "A Philoſopher," with a ſcroll, both in octavo. A ſet of ſeven ſmall plates of "The Planets," and another ſet of "The Five Senſes;" a folio print, entitled "Imperii ac Sacerdotii ornatus, diverſarum gentium veſtitus;" another of the ſame ſize, entitled "Diverſarum gentium armatura equeſtris, 1577;" a ſet of forty-nine, inſcribed "Omnium fere gentium imagines," &c. quarto ſize. Seventy-ſix plates, of figures of knights on horſeback, in octavo. A ſet of friezes, of the various modes of hunting and hawking, marked with his two cyphers. Twelve plates of animals, in quarto; "Pyramus and Thiſbe," after Franc. Floris; "The Reſurrection of Lazarus," from Criſpin vanden Broeck, both in quarto; and a ſet of ſmall arabeſque ornaments.

Nicholas de Bruyn was born at the ſame place with the former artiſt, of whom he was the ſon, and of whom he learned the rudiments of his art; though he did not imitate him either in his ſtyle of engraving, or the ſmallneſs of the prints which he executed. He rather copied the ſtyle of Lucas Jacobs of Leyden, whoſe works he appears chiefly to have ſtudied; and engraved large plates, which he executed entirely with the graver, in a very neat but laboured ſtyle. His prints evidently prove, that he had more fertility of invention than taſte, and he wanted judgment to ſelect ſuch forms only, as were beautiful or ſuited to the occaſion. His compoſitions are generally crowded with figures, but from the following cauſes his effects are feeble; the lights are too much diffuſed, and the breadths of ſhadow by no means ſufficient to relieve the principal objects from thoſe at a diſtance; in conſequence of which, the whole appears confuſed and unfiniſhed. His drawing is carefully attended to; but it is rather mannered than correct. The heads of his figures are frequently very expreſſive; yet, amidſt all the diſadvantages which this artiſt laboured under, much ſterling merit is conſpicuous in his productions. The cyphers, with which he marked his plates, will both be found in our ſecond plato of thoſe uſed by the engravers of the Low Countries: and amongſt his works we ſhall ſelect the following as being moſt worthy of notice.

From his own Compoſitions.—"Adam and Eve in Paradiſe,” in large folio ; “Adam and Eve eating of the forbidden Fruit ;” “The grand Feſtival of the Jews, after ſix Years Bondage ;” “The King Balac, communing with the Prophet Balaam ;” “The Prophet Jeremiah,” in a landſcape ; “The Viſion of Ezekiel ;” “David and Goliah ;” and “Abigail meeting David ;” both with landſcape backgrounds ; “Solomon and the Queen of Sheba :” “Solomon adoring the Idols ;” “The Dream of Nebuchadnezzar ;” “Daniel in the Lion's Den ;” “Suſannah and the Elders ;” “Suſannah juſtified ;” “Two old Men ſtoned to Death ;” “The Nativity of our Saviour announced to the Shepherds ;” “The Adoration of the Eaſtern Kings ;” “A Repoſe during the Flight into Egypt ;” “The Slaughter of the Innocents ;” “St. John preaching in the Deſart ;” “Our Saviour preaching on the Mount ;” “The Centurion imploring the Help of Jeſus Chriſt ;” “The Entry of Chriſt into Jeruſalem ;” “Our Saviour on his way to Mount Calvary ;” “The Crucifixion ;” “The Reſurrection ;” “St. Paul preaching ;” “St. Hubert perceiving a Crucifix between the Horns of a Stag ;” “Orpheus charming the Animals with his Lyre.” Peaſants, with their children, regaling ; a landſcape, into which is introduced lions, tygers, and ſtags ; a large company of Spaniards in a foreſt ; all theſe are of large folio ſize ; a ſet of ſix prints, in octavo, for goldſmiths, from fables ; twelve plates of animals for a book of quadrupeds ; and two ſets of thirteen each, of birds and fiſhes.

Subjects from various Maſters.—“St. John preaching in the Wilderneſs,” from Lucas of Leyden ; “A Miracle performed at the Tomb of St. James,” a Spaniſh apoſtle, from the ſame painter ; “The Golden Age,” from Abr. Bloemart ; this is conſidered as his fineſt print, and was admirably copied in a ſmall circle by Theodore de Brye ; “Abraham ſacrificing Iſaac,” after Giles Coninxlo ; “The Predictions of the Prophet Iſaiah ;” “The Judgment of Midas,” a fine landſcape, with figures, all from the ſame painter ; a village fair, from Dav. Vinckenbooms ; a landſcape, with a caſtle ; a view of a garden, with buildings, and figures dancing, both from the ſame painter ; a ſtag hunt, after John Breughel ; a fine landſcape, into which is introduced the ſubject of “Moſes defending the Daughters of Jethro,” after Hans Bol. ; “St. Cecilia,” accompanied by other ſaints, copied, with ſome alteration, from Raphael ; “The Four Seaſons,” from M. de Vos ; and an armed knight on horſeback, preceded by an allegorical figure on horſeback, and followed by the devil on foot, copied from what is commonly termed “The Worldly Man” of Albert Durer ; all are of folio dimenſions.

The family of the Sadelers make a very conſiderable figure in the annals of engraving : yet are they, unleſs we ſhould except Giles, leſs illuſtrious by the character of their works as engravings, than worthy of notice on account of their number, ſubjects, and the period at which they were performed.

Hans or John Sadeler was born at Bruſſels, A.D. 1550. His father is believed to have been an armourer, or workman in iron and ſteel ; for the firſt employment that is known to have been exerciſed by John, was to engrave ornaments, &c. upon thoſe metals, in order to their being inlaid with the precious metals. Hence Florence le Comte terms him a *damaſquineur* of iron ; a word which probably, at that time, was the proper technical denomination of that particular branch of the armourer's profeſſion, and which is perhaps derived from Damaſcus, where arms have been fabricated with ſimilar ornaments from a very early period.

It appears, however, that our artiſt did not confine himſelf to the ſcroll-work and heraldic ornaments, which were prevalent at the time, but applied himſelf with requiſite diligence, at an early period of life, to the ſtudy of the human figure, of which he evinced an accurate knowledge ; though, in conſequence of early tuition, and the Flemiſh and German examples which had been placed before him for imitation, he drew in a ſtiff and mannered ſtyle.

From theſe early ſhackles, however, which, till Rubens appeared, Flanders unwittingly forged for all her ſons, Sadeler in a great meaſure emancipated himſelf, when he came to ſtrengthen his faculties by breathing the purer atmoſphere of art that circulated in Italy.

He did not at once travel from Bruſſels to Italy, but publiſhed ſeveral of his earlier engravings at Antwerp ; from whence, in the year 1588, he went to Frankfort, and continued to travel over great part of Germany, in order to obtain inſtruction from the beſt maſters who were then living in that country. At Munich he remained a few years, where his merit being made known to the duke of Bavaria, he was very graciouſly received ; and that nobleman made him a preſent of a chain of gold. From Munich he went to Verona ; from thence to Venice, and afterwards to Rome ; but not meeting with the encouragement he expected from the pope, he returned to Venice, where he eſtabliſhed himſelf, and died in that city of a fever, in the year 1600. It is uncertain from whom he firſt learned the art of engraving ; but it appears that he availed himſelf of the inſtructions of a variety of maſters. His earlieſt productions have much of that ſtiffneſs, not only in drawing, but in point of manual execution, which eclipſes the merit of the old engravings of the German ſchool. It is true, that after he reſided in Italy, he made a conſiderable improvement in his ſtyle of engraving, eſpecially in the landſcape parts of his plates ; but he never entirely diveſted himſelf of the habit he at firſt acquired. He worked with the graver only, in a clear neat ſtyle ; but his plates were never highly finiſhed. We ſee in them, however, the hand of a very able artiſt, much correctneſs of drawing, and great expreſſion. His engravings are exceedingly numerous ; and though a complete collection of them is rarely to be ſeen, detached prints and ſets of prints are by no means uncommon. They are uſually marked with his initials combined in a cypher, for which ſee *Plate* II. of thoſe uſed by the engravers of the Netherlands. The following are thoſe which are held in moſt eſtimation.

Portraits.—Orlando Laſſus, maſter of the chapel of William, duke of Bavaria, in 8vo. ; Sigiſmond Feyerabend, a famous printer of Frankfort-on-the-Maine, in 4to. ; George Hoefnagle, an artiſt of Antwerp, and one of the coadjutors of Ortelius the geographer, an engraving of merit, in 4to. ; her royal highneſs Mary de Medicis, queen of France and Navarre ; Charles, prince of Sweden and duke of Sudermania ; Chriſtopher, baron of Teuffenpach, from J. ab. Ach., all in 4to. ; a three-quarter portrait of Herdeſianus, a celebrated juris conſulte, with twelve Latin verſes, in folio ; a profile of Martin Luther, in folio ; Otho Henry, count of Schwarzenberg, and counſellor of William of Bavaria, ſitting at a table, in large folio ; an hiſtorical portrait of Clement VIII., in an oval ; and St. John Capiſtranus, a monk of the order of St. Francis, both of folio ſize.

Various Sets.—“The Creation of the World,” commencing with the forming of the ſun and moon, and ending with the exile of Adam and Eve from Paradiſe, in a ſet of eight, after Criſpin Vanden Broeck ; a ſet of ſix, containing the hiſtory of Adam and Eve, and Cain and Abel, after Michael Coxie ; ſixteen ſubjects from the book of Geneſis, with Latin verſes, from Martin de Vos ; “The

Life of Chriſt,” from the ſame painter; a ſet of hermits, engraven conjointly by the two Sadelers, from the ſame painter. This ſet is much eſteemed, partly on account of the romantic variety of the back-ground landſcapes. A ſet of twelve landſcapes of the months of the year, from P. Steevens; “The four Parts of the Day,” after Theod. Bernard; “The four Seaſons,” with Latin verſes, after H. Bol, all of folio dimenſions.

Hiſtorical Subjects.—“The Virgin and holy Infant aſleep, and an Angel,” from Carracci, in 4to.; “The Feaſt of Dives,” after Baſſan; “Jeſus at the Houſe of Martha;” and “Jeſus with the two Diſciples at Emmaus.” Theſe three prints are commonly known among collectors by the appellation of “Sadeler's Kitchens.” “The Angel appearing to the Shepherds,” a night-piece; three plates of “The Nativity,” treated in different ways, all of folio ſize, from Baſſan, and a fourth of the ſame ſubject from Polidore de Caravaggio, in large folio; “St. Jerome praying, in his Cell, before an Image of the Virgin;” “Mary Magdalen praying in a Cell,” both very fine engravings, after Giles Moſtaert; “The patriarchal Family of Enoch,” in a very fine landſcape; “St. Roch and his Dog, with two Pilgrims,” both in folio, from the ſame painter; “Jeſus calling little Children,” in large folio, from J. de Winghe; “Bacchus ſeated on a Tub, accompanied by Love and Muſic;” “St. Paul at Corinth, at the Houſe of Aquila,” all in large folio, from the ſame maſter; “The Annunciation,” from Pietro Candido; “The three Maries at the Sepulchre;” and “St. Mary the Egyptian,” all in 4to.; “The Laſt Supper,” in folio; “The Virgin and Infant Chriſt, worſhipped by St. Stephen and St. Lawrence,” in large folio, all after Candido; “The Martyrdom of St. Urſula,” in large folio, from the ſame painter; “The Nativity,” after Hans von Achen, in 4to.; “The Death of our Saviour;” “The Virgin and Infant Jeſus, with the Magdalen kiſſing his Feet, behind them is St. Joſeph,” both in 4to.; “The Virgin and Infant Chriſt ſeated on a Throne, with the two St. Johns and Angels,” in folio, after the ſame painter; “A Repoſe during the Flight into Egypt,” from Chriſtopher Schwarz, in folio; “The Crucifixion,” with the Virgin and St. John at the foot of the croſs; “The Paſſion of our Saviour,” in ſeven large folio plates; “The Laſt Judgment,” in large folio, a very capital print; “A Courteſan ſitting by a Fountain, playing the Lute, wiſhing to attract the Attention of a Youth, whom a Sage is conducting another way,” in folio, all from Schwarz; “The penitent Magdalen,” from Frederic Suſtris, in folio; “Jeſus appearing to the Magdalen as a Gardener,” in folio; “The Annunciation,” in 4to.; a whimſical compoſition of “A holy Family,” with angels in the air, carrying the materials for the church of Jeſuits at Munich, in folio; “Hercules between Vice and Virtue, with Jupiter in the Clouds,” in large folio, all from Suſtris; “The good Shepherd,” from H. Bol; “The mercenary Shepherd,” from the ſame; “The four Seaſons;” a landſcape, where three herons are introduced in the air, from Paul Bril; “The four Seaſons,” from Bol; a pair of landſcapes, and a mountainous landſcape, with a caſtle on a rock, all after Bril, in folio; “Man ſurpriſed by the Advent of the Deluge,” and “Man ſurpriſed by the Arrival of the Day of Judgment,” a companion to the former, both from Th. Bernard, in large folio, two of the moſt celebrated and beſt engravings by this artiſt; “The Son of God ſitting at the right Hand of his Father, in the Clouds, attended by the Holy Ghoſt, the Archangel Michael, and other Angels,” after a picture by Antonio-Maria Viani at Munich, a very fine and rare print; and “A View of the City of Venice and Bucentaure,” both in large folio.

Raphael Sadeler the elder, was born at Bruſſels in the year 1555, and was the younger brother of John. Like him, Raphael was originally a *Damaſquineur* of iron and ſteel, a profeſſion which is now become obſolete; and like him, travelled through Germany to Italy for his improvement in art, and finally ſettled at Venice.

Whether Raphael followed John, or the brothers accompanied each other to Italy, is uncertain; but he continued to reſide at Venice, having a joint ſhare, as is believed, with his brother, in a commercial eſtabliſhment there, till the time of his death, which happened in the year 1616.

When he was about the middle period of life, it was found that his application to engraving had weakened his ſight; painting, he thought, required leſs optical exertion, and in this art he ſought and found refuge, till, the ſtrength of his eye-ſight returning, he reſumed the graver.

With his ſucceſs as a painter, we are not acquainted. His engravings greatly reſemble thoſe of his brother; he underſtood the human figure exceedingly well; his extremities are in general ſkilfully marked, and his hiſtorical heads are characteriſtic and expreſſive. His portraits too, of which he executed ſeveral, poſſeſs a conſiderable ſhare of merit.

The Sadelers, John and Raphael, often worked in conjunction, and produced a great number of plates. Separate portraits of them of quarto dimenſions, were engraved and publiſhed by Cornelius Waumans, with French inſcriptions beneath.

Of the engravings of Raphael, the following, generally ſpeaking, will be found moſt worthy of ſelection.

Portraits.—Paulus V. Pont. Max. in ſmall folio; St. Charles Borromeus, cardinal, in folio; Erneſt, archbiſhop of Cologn, in folio; Leopold of Auſtria, biſhop of Salzbourg, and Paſſau, after H. Keſſel, in 4to.; Leopold, archduke of Auſtria, biſhop of Ratiſbon, in folio; John Dietmar, abbé of Furſtenberg, in folio; Hypolyte, Guarinonius, Dr. of Medicine, in 4to.; Philip de Monte, muſical director to the emperor Rodolph II., in 8vo.; Ferdinand, archduke of Auſtria, in a 4to. oval; and Charles-Emanuel, duke of Savoy, on horſeback; after John Carrara, in large folio.

Hiſtorical, from various Maſters.—Four ſubjects from the Life of the Holy Virgin; 1. The Salutation. 2. The Viſitation. 3. The Marriage. 4. The houſhold Management of the Virgin, in 12mo. A ſet of twenty-eight from the Life and Paſſion of our Saviour, in 12mo.; “Mary Magdalen at the Sepulchre, with Sts. John and Peter,” after Jod. de Winghe, in 4to.; the voluptuous life of Sardanapalus, ſurrounded by his women, in 4to; “Lot and his Daughters,” in a fine landſcape, in large folio, both after the ſame painter; “A Holy Family,” conſiſting of the Virgin and Child, Elizabeth introducing the infant St. John, St. Joſeph reading, an angel, and two half figures, in folio, from Hans von Achen; “The Entombing of Chriſt,” in an oval, of folio ſize; “Two Angels in the Sepulchre, with the Body of our Saviour,” in folio; “The Reſurrection,” inſcribed “Chriſti de morte triumphus,” a circular print, in folio; (theſe three prints are very much eſteemed;) “The Magdalen in a Cell,” with a croſs in her hand, reading a book, ſupported by a ſkull, in 4to.; “Love careſſing the Muſes of Painting and Muſic,” in 4to.; “The Judgment of Paris,” a grand compoſition, all after Von Achen, in folio; “The Nativity of our Saviour,” after Matth. Kager, in 4to.; “St. Cunégonde, atteſting his Innocence;” and “St. Elizabeth relieving the Poor,” both in folio, and from the ſame painter; “The Virgin and Child,” with St. Joſeph, and two angels preſenting fruit, in ſmall folio ; a half figure of the Virgin, with the holy infant on a cuſhion, in 4to. ; “The Virgin and Child crowned,” in folio, both after Candidus ; “St. Francis,” (in the back-ground is a figure proſtrate before a crucifix,) in folio ; and “The Immaculate Conception,” both in folio, and after Candidus ; “The Virgin ſeated under a Canopy,” preſenting the infant Chriſt to a high-prieſt, accompanied by many other figures, in large folio, from the ſame painter ; “The Reſurrection of Lazarus,” after J. Rotenhamer, in folio ; “The Marriage of St. Catherine,” in a landſcape, from Henry Goltzius, in folio ; “God appearing to Cain, after the Murder of Abel,” from M. de Vos ; “The Dead Chriſt,” attended by the three Maries, St. John, and two angels holding torches, after Stradan ; “Venus, Bacchus, and Ceres,” inſcribed “Sine Cerere et Baccho friget Venus. Gil. Coignet inv. ;” “The Uncertainty of Life,” exemplified by Death ſeizing a lady at a grand repaſt, after Stradanus ; “Chriſt on the Croſs, attended by St. John and the two Maries,” from the younger Palma, all of folio ſize ; “The Virgin ſuckling the Infant Jeſus,” ſurrounded by a garland of flowers, in 4to. from Carracci ; “A Holy Family,” where the infant Jeſus has one knee on his cradle, and the other on his mother's lap, while St. John preſents him a little croſs : the back-ground preſents a mountainous landſcape, in folio, from Raphael. A fine circular print of “The Annunciation,” a poetical compoſition, after F. Zuccaro, in folio ; “The Adoration of the Kings,” in folio, after Baſſan ; “Jeſus at Table with the Pilgrims to Emmaus,” after the ſame painter ; a female milking a cow, and giving drink to a little boy, in folio, known by the appellation of “The Little Milk-woman,” in folio ; “The Four Seaſons,” in folio, engraved by Raphael in conjunction with his brother John, all from Baſſan ; “The Four Seaſons,” after J. Stradan, in folio. Six landſcapes, ornamented with rocks, wood, and water, after P. Steevens, in 4to. Two wild landſcapes, after Matth. Bril, in folio. Four landſcapes, with the hiſtory of the good Samaritan, in folio, from P. Bril. Four landſcapes from the ſame painter, in folio. Another ſet of four, after the ſame. A ſet of ſix emblematical figures, inſcribed “Amor,” “Nuptia,” “Labor,” “Honor,” “Arma,” and “Venatio,” after Martyn de Vos. A ſet of four allegorical ſubjects, on the four temperaments of man, in folio, from de Vos. A ſet of ſaints, entitled “Bavaria ſancta,” and “Bavaria pia,” in folio, after Matth. Kager, engraved by Raphael the elder, and his ſon of that name. And “The Battle of Prague,” engraved on eight plates, in folio, extremely rare, and marked with the name of Raphael Sadeler.

Egidius, or Giles Sadeler, was born at Antwerp A.D. 1570, and died at Prague in 1629. He was the nephew and diſciple of the two preceding artiſts, and following their ſteps, travelled through Germany and Italy, reſiding awhile in thoſe cities where art flouriſhed, for his improvement.

He was afterwards invited to Prague by the emperor Rodolphus II. who gave him a penſion, which was afterwards continued by his ſucceſſors, the emperors Matthias and Ferdinand II. He handled the graver with more facility, taſte, and freedom than his uncles, and repreſented the textures of his objects with more feeling than had hitherto been diſplayed, unleſs by the very firſt artiſts of the German ſchool.

He treated portraits and hiſtorical ſubjects in a broad free ſtyle, and harmonized and oppoſed his lights and ſhadows in ſo judicious a manner, that it produced forcible effect, without blackneſs.

He generally drew correctly, but in the ſubjects he engraved after Spranger, the contours of his figures, in conformity with the extravagant ſtyle of that maſter's deſign, are overcharged ; he excelled both in portrait and landſcape ; and was called by his contemporaries the phœnix of engraving. The following remarks from the pen of Watelet, which he intended ſhould be applied to the whole family, are more particularly applicable to Giles. “It is aſtoniſhing the ſucceſs with which the Sadelers have engraved landſcape with the graver ; the old trunks of trees have all the freedom of the pencil, and playfulneſs of etching ; and it is impoſſible to repreſent, in any better way, falls of water, rocks, and the depths of foreſts : the various weeds and plants which are introduced on the fore-grounds are extremely like nature, and the buildings and back-grounds are executed with ſo much taſte, that it repreſſes our regret for the diſcouragement of etching.” From the numerous engravings of this maſter, the following will be found worthy of ſelection.

Portraits.—Burckhard de Berliching, privy-counſellor of the emperor Rodolphus II. ; Chriſtopher Guarinonius Fontarus, phyſician to the emperor Rodolphus, a very excellent and rare print ; John George Gædalmann, juris conſulte ; Joachim Huber, counſellor ; Jacob Chimarrhæus, grand almoner to the emperor ; the cardinal of Dietrichſtein, biſhop of Olmutz ; Otto de Starſchedel, counſellor to the elector of Saxony, all of quarto ſize ; William Angelle, plenipotentiary to Henry IV., in folio ; John Matthew Warenfels, counſellor ; Adam, baron of Trautmanſdorf ; Siegfried de Kolonitſch ; Ferdinand de Kolonitſch ; the three ambaſſadors from the ſophi of Perſia to the emperor Rodolphus, *viz.* Mechti Kuli, Beg Sinal Chaen, and Cuchein Ollibeg, all in folio ; Torquatus Taſſo, a very rare print, in 4to. ; Octavius Strada, antiquary, in 4to., rare ; Peter Breughel, the elder, in folio ; Martin de Vos ; Sigiſmond Bathori, prince of Tranſylvania ; Michael Voivode of Walachia, in an oval ; Charles de Longueval, count of Buquoi, all in folio ; buſt of the emperor Matthias, ſurrounded with allegorical figures and inſcriptions ; a pair of the emperor Matthias, a three-quarter figure, and its companion, the empreſs Anne, both in large folio ; a large upright print of the emperor Rodolphus on horſeback ; the emperor Ferdinand II. on horſeback, with various emblematical figures and inſcriptions, in two large plates, joined ; an allegorical ſubject on the marriage of the emperor Ferdinand with Eleanor of Mantua, in folio ; and an allegorical ſubject on the protection given to the fine arts by the emperor Rodolphus, a very fine print, in large folio.

Subjects from his own Compoſitions.—A ſet of twelve, of angels with the inſtruments of the paſſion of our Saviour, in ſmall 4to. ; a ſet of four, of the Evangeliſts, in 4to. ; a ſet of fifty-two views in Rome, entitled “Veſtigi delle Antichita di Roma,” in folio ; a landſcape and figures, a rare print, in 8vo. ; “The Burning of Troy,” an etching in 4to. ; a building with niches, introducing the four ſeaſons ; “Charity,” with three children, both in folio ; “Narciſſus admiring himſelf in a Fountain,” in large folio ; “Pan and Syrinx preparing to bathe,” in folio ; “St. Sebaſtian dying, with the Angel extracting the Arrows from his Side,” in large folio ; “St. Dominic receiving the Inſtitutions of his Order ;” “St. Peter and St. Paul ;” “The Scourging of Chriſt ;” “The Crucifixion,” all in large folio ; and a grand compoſition of “The Hall of Prague,” on two plates, a very capital engraving.

Hiſtorical, &c. after various Maſters.—“The holy Virgin ſuckling the Infant Chriſt,” from a picture by Raphael, in the Florentine Gallery, known by the appellation of “Madonna della Segiola;" "The Angel appearing to the Shepherds," after Baſſan, in folio; "St. Chriſtopher bearing the Infant Chriſt on his Shoulder," in folio; "The Murder of the Innocents," in large folio, from Tintoretto; "The Call of St. Peter," after F. Barroccio; "Chriſt carried to the Tomb," a fine print, arched at the top, from the ſame painter; "The Scourging of Chriſt," from Joſeph d'Anpinas; "The Martyrdom of St. Sebaſtian," after the younger Palma; "The rich Man in Hell, and the poor one in Heaven," from the ſame painter; "Angelica and Medora," writing on the bark of a tree, from Carlo Caliari, all in large folio; "Eſclavonia," a young female, elegantly apparelled, from Titian, in folio; an allegorical print on the death of the wife of Spranger, accompanied with a medallion; "The three Maries going to the Sepulchre;" "The Arts and Sciences triumphing over Ignorance and Barbariſm;" "Hercules and Omphale;" "Venus and Cupid," all in large folio, after Spranger; "The Annunciation," after de Witt, in large folio; "Reward," a winged figure, ſtanding on a globe, inſcribed "Dat Deus omne Bonum;" an obeliſk with the armour of the count of Mansfeld, inſcribed "Sum Umbra Alarum Aquilæ," both in large folio; two buſts of angels, after Albert Durer; two fine heads of youths; "The Virgin and Child," in a landſcape, ſurrounded by animals; in the back-ground is introduced the Annunciation of the Shepherds, engraved with great delicacy; "Chriſt bearing the Croſs," all after Albert Durer, in folio; "Judith with the Head of Holofernes," from H. von Achem; "The Adoration of the Shepherds;" "The Virgin and holy Infant, careſſing the little St. John," all in folio, from the ſame painter; "Minerva introducing Painting to the Muſes," a grand compoſition, in the taſte of Spranger, in large folio, from Ab. Ach.; and four ſubjects from the Life of the Virgin, *viz.* "The Annunciation," "The Viſitation," "The Circumciſion," and "The Aſſumption," after J. Speccard, in folio.

Landſcapes.—A ſet of fifteen, from John (commonly called Velvet) Breughel, in folio, in which are introduced, 1. St. Jerome before a crucifix. 2. A repoſe during the flight into Egypt. 3. Tobit with the angel. 4. Our Saviour tempted in the wilderneſs. 5. St. Francis ſtigmatiſed. 6. A fiſh-market on the ſea-coaſt. 7. A view of a gulf, with company on the ſhore. 8. A ſtage-coach driving. 9. A windmill and village on the banks of a river. 10. A company of gypſies. 11. A ſtone and a wooden bridge, with two pilgrims. 12. Two travellers, one of whom is repoſing. 13. A woody landſcape. 14. Soldiers deſcending a mountain. 15. A ferry-boat.

Various, from Paul Bril, in folio.—A mountainous landſcape, into which is introduced a repoſe during the flight into Egypt; "A Hermit reading in his Cell," in a landſcape; two bridges of wood and ſtone; a mountainous landſcape, ornamented with cattle and figures; ſix views in Italy, with buildings and cattle; ſix landſcapes, into which are introduced the twelve months of the year, very capital engravings.

Landſcapes from Roland Savery.—A ſet of ſix views in Bohemia, with mills, water, and wood, in ſmall 4to.; another ſet of ſix, in Bohemia, with cataracts, travellers, &c. in ſmall folio; another ſet of ſix: 1. Villagers regaling under a trellis-arbour. 2. Buildings on the banks of a canal. 3. A ſtag-hunt. 4. Labourers on the top of a mountain. 5. A goat-herd repoſing near a caſcade. And, 6. A warrener, in folio. A ſet of five grand landſcapes, from the mountains of Tyrol, in folio, with cataracts, figures, &c.; and two others, of rock and foreſt ſcenery, alſo from the mountains of Tyrol.

From Pietro Stephani.—A ſet of four rich landſcapes, of the ſeaſons, in large folio; a ſet of eight fine landſcapes, with wind-mills, figures, &c. in large folio; and another ſet of twelve, in folio, of the months of the year.

Of the ſame family, but of merit ſomewhat inferior, were Jooſt or Juſtus, Philip, and Raphael Sadeler the younger, who were ſeverally inſtructed by their parents, and worked mechanically in the ſame ſtyle, merely multiplying the number of prints, without advancing in the ſmalleſt degree the general claims or capabilities of their art.

Juſtus was the ſon of John, and his beſt performances are certain portraits of the family of Gonzague, and an odd ſort of Dutch "Holy Family," from Rottenhamer, wherein the holy Virgin is repreſented ſwaddling the infant Saviour, while an angel is ſtrangely buſied in warming his linen.

Raphael Sadeler, the younger, was the ſon of the Raphael whom we have mentioned above, and occaſionally aſſiſted his father in his profeſſion, particularly in engraving the ſet of Bavarian ſaints. He alſo engraved "Venus and Adonis," a ſmall upright, from Titian, and "The four Evangeliſts," from P. Candidus, with other devotional ſubjects.

Philip was the degenerate ſon of Giles. A Mark Sadeler has alſo been mentioned, but is believed to have been only the publiſher of the works of his more ingenious relations.

Among the caprices of fortuitous biography, it has been the fortune of ſome who have benefited mankind, to have their merits paſs unrecorded. Von Londerſel, on the contrary, though not of firſt-rate talent, has been celebrated under two names, both by Papillon and by Strutt.

He appears to have been a native of Holland, born about the middle of the ſixteenth century, and to have been chiefly engaged in the execution of letter-preſs engravings, in a neat and delicate ſtyle, reſembling that of Virgil Solis, and which are marked ſometimes with one and at other times with the other of the two monograms, which will be found in *Plate* II. of thoſe of the ſchool of the Low Countries.

It is not unlikely that theſe *two* marks may have given riſe to the ſeparation of his works into thoſe of Ahaſuerus Landfeld, and Ahaſuerus Londerſel. That he was related to the John Von Londerſel, of whom we ſhall treat hereafter, is highly probable. From the ſmallneſs of his productions, of which the greater number adorn the books that were publiſhed at Antwerp about this period; he is claſſed among *the little* maſters, but his engraving of "The Laſt Supper" is on a ſomewhat larger ſcale.

Among the books which he thus decorated, are the 4to. edition, in the French language, of "The Travels of Nicholas de Nicolay into Turkey," printed at Antwerp in 1576, and the large Herbal of Matthias de Lobel. Detached ſubjects from the holy ſcriptures are ſometimes to be met with, which probably belong to a bible, in which Londerſel at leaſt aſſiſted in the production of the engravings.

Charles de Mallery was born at Antwerp A. D. 1576; it is not known of whom he learned the rudiments of drawing and engraving, but from the great reſemblance his ſtyle bears to that of the two Wierixes, it is probable he ſtudied in their ſchool. He was a very laborious artiſt, and engraved a great number of devotional ſubjects, animals, and book ornaments.

He worked with the graver only, and ſo exceedingly neat, that he, in ſome inſtances, equalled the moſt laboured performances of Jerom and Anthony Wierix. But then he did not draw ſo correctly; ſo that with inferior powers as an *artiſt*, he ſeems to have poſſeſſed the ſame ſhare of patience and attention, and manual ſkill. He had the honour of having his portrait twice painted by Vandyke, both were ſucceſsful pictures, and the prints after them by Vorſterman and

Morin, are well known. In the collection of the abbe Marolles were three hundred and forty-three of the engravings of Mallery; among the beſt of which may be mentioned “The Adoration of the Kings,” in 12mo.; “The youthful Saviour,” in a landſcape, accompanied by two angels; “The Canaanitiſh Woman;” “A Crucifix,” held by a man ſurrounded with allegorical figures; “St. Francis;” and “St. Jacintha,” in 12mo.; “The Holy Family,” accompanied by a Magdalen, in 4to.; “Chriſt among the Doctors,” in 12mo.; various heads of Chriſt, the Virgin Mary, the apoſtles, ſaints, &c. Some of the plates, for the great hunts by Stradan, which were produced in conjunction with the Galles, Collaerts, &c. in 4to. The hiſtory of the ſilk worms (which were brought by two monks into Europe), on ſix middling-ſized plates, lengthways, from J. Stradan, entitled “Vermis Sericus;” a buſt of “St. Anthony,” in an hiſtorical border, after Stradan; the fable of “The Man, his Son, and his Aſs, going to the Fair,” in four 4to. plates; and various plates of horſes, for a book entitled “De la Cavalerie Françaiſe,” in 4to., from the ſame painter.

Having already treated of the education and general merits as an artiſt of Paul Bril, of Antwerp, who performed ſome ſpirited etchings of landſcape ſcenery about the period now under our review, it remains but to mention ſuch of his etchings as are held in moſt requeſt among connoiſſeurs. Theſe are all of folio dimenſions, and are known by the following deſignations: a pair of views in the Campania of Italy, with rocky fore-grounds, adorned with buildings, &c. dated 1590; another pair, inſcribed “Paulus Bril inv. et fec. Vicenzo Cenoiformis Romæ;” another view in the Campania, of the upright form; four landſcapes belonging to a ſet, of which the remainder are engraved by Nieulandt. Sandrart mentions alſo a large and grand engraving by this artiſt, of which the ſubject is a view in the Campo Vaccino. For further information reſpecting this artiſt, ſee the article BRIL in our fifth volume.

Chriſtopher Van Sichem was born in Holland in the year 1580, and reſided chiefly at Amſterdam. He was inſtructed in the principles of engraving by Goltzius, from whom he copied ſome good portraits. The merit of his engravings on copper, conſiſts principally in the neatneſs of their executions, but thoſe on wood, after his maſter, are engraved in a bold ſtyle, and often poſſeſs a good effect, though he wanted taſte. His monogram will be found in our ſecond plate of thoſe uſed by the engravers of the Low Countries.

The moſt conſiderable work he executed is intitled “Iconia Hæreſiarcharum,” &c. It conſiſts of a great number of ſmall upright plates, of the principal reformers of the church, is engraved from his own deſigns, and was publiſhed at Amſterdam in 1609.

On Copper.—A profile of Johannes Calvinus Nouioduni, holding a book, ſurrounded with an hiſtorical border; David Georgius Delphis, in Batavia, pernicioſiſſimæ ſectæ auctor; Durch Chriſtop Von Sichem, *Formſchneider* und *Kupfirſtecher* (*i. e.* cutter of wood, and engraver of copper); Rob. Dudleus, Leyceſtriæ comes; Francis Valeſius, dux Alençon; the emperor Charles V. in the imperial coſtume, inſcribed “Carolus quintus Imperator Cæſar Auguſtus;” and queen Elizabeth, in regal attire; all of quarto dimenſions. The two latter portraits have been by ſome, attributed to Charles Van Sichem. Chriſtopher alſo engraved the whole-length portraits of the earls of Holland and Zealand, in folio, from drawings by himſelf.

On Wood.—A ſet of twelve hiſtorical ſubjects, in 12mo. rare; “Eſther before King Ahaſuerus,” in 4to. from Lucas of Leyden; “The Adoration of the Shepherds,” after Ab. Bloemart; “The Circumciſion,” after H. Goltzius; “Judith with the Head of Holofernes,” all in 4to.; “St. Cecilia playing on the Organ,” and four other figures ſinging; buſt of a man, with a hat and feathers, all from the ſame painter; buſt of an African prince, with a helmet ornamented with diamonds and feathers, from J. Matham; a ſet of four, repreſenting Judith, Siſera, David, and Sampſon, from H. Goltzius; and a ſet of four, repreſenting the Evangeliſts, with a hiſtory of their lives in Dutch; very meritorious prints: all the latter are of folio dimenſions.

The baron Heinneken mentions two other Dutch engravers of the name of Van Sichem (*viz.* Cornelius and Charles); and Papillon and Baſſan, the latter copying and magnifying the error of the former, has given ideal exiſtence to a third.

Cornelius is often confounded with Chriſtopher, but was of inferior talent. He was of the ſame family, and flouriſhed about forty years afterwards.

Of laborious induſtry, and as if pleaſureable ſtimuli rarely reached his mind, he ſcraped together not fewer than 600 ſubjects of figures of holy perſonages, ſcripture hiſtories, and legendary tales, which he engraved in a ſtiff and heavy ſtyle, but many of them were copies from prints.

Charles was alſo of the ſame family, and engraved both on copper and on wood, but his prints merit not much attention. Their ſeveral monograms will be found in *Plate* II.

Jacques de Gheyn, or Ghein, the elder, was born at Antwerp in the year 1565, and died in 1615. He learned the elements of painting of his father, who was a painter on glaſs; and engraving he ſtudied under Henry Goltzius. He ſucceſsfully imitated the manner of his maſter, and worked with the graver only, in a bold free ſtyle, which manifeſts the great command he had of that inſtrument. He drew correctly and frequently with much taſte; but all his works want effect, from the lights being ſcattered, and too equally powerful; neither are the maſſes of ſhadow ſufficiently broad, nor well harmonized. The number of his engravings amount to one hundred and ſeventy. He likewiſe painted flowers and ſmall figures with conſiderable ability. The monogram of this artiſt will be found in *Plate* II. of thoſe uſed by the engravers of the Low Countries. Among his works the following are moſt worthy of notice.

Portraits.—Tycho Brahe, the celebrated Daniſh aſtronomer; Abraham Gokevius, a famous antiquary of Amſterdam; Hugo Grotius, the ſtill more famous philoſopher; and Philip de Marnex, a diſtinguiſhed Calviniſtic reformer, all in 8vo.; Coſmo de Medicis, who is here called “The Father of his People,” a circular print; Sigiſmond Malateſta, a military officer; and Joannes Baſilowitſch, autocrator of Ruſſia, all in 4to.

Subjects from his own Compoſitions.—“Vanity,” repreſented by a female figure at her toilet; “Mary Magdalen,” a ſmall oval; two ſmall medallions of Mars and Venus; “A Gipſy telling a young Woman her Fortune,” in folio; “The Statue of Laocoon and his Sons,” in large folio; “A Lion couchant,” with a landſcape back-ground, a very rare oval print, in folio. A ſet of ten, very rare and celebrated prints, in ſmall folio, of Maſques. The twelve firſt Roman emperors, a ſet of circular prints in quarto, very much ſought after; “The Sabbath, or Rendezvous of Sorcerers and Sorcereſſes;” a large folio print, engraved on two plates.

Subjects after various Painters.—The Paſſion of our Saviour, a ſet of fourteen, engraved in conjunction with his pupil Zechariah Dolendo, after Van Mander, in octavo; “The Twelve Sons of Iſrael,” half-length figures, after Karl van Mander, in quarto; two emblematical ſubjects, on the folly of thoſe people who ſpend their time and money in purſuit of pleaſure, on two large plates; “The Erection of Babel, and Confuſion of Languages,” in large folio; “The Adoration of the Trinity,” in folio; “The Judgment of Midas,” in large folio; “The Prodigal Son,” a very fine print, in large folio. all from Karl van Mander; “The Crucifixion,” a grand compoſition; and “The Apple of Diſcord thrown among the Gods,” both in large folio, and after Vanden Broeck. A ſet of four, in circles, of the Evangeliſts, after H. Goltzius, in quarto; “The Empire of Neptune,” a circular print, in folio, after Guil. Telcho. A ſet of twelve, reckoned among the very beſt of the engravings of our artiſt, of the guards of the emperor Rodolphus II. after Henry Goltzius; “The Annunciation,” after Abr. Bloemart; “A Repoſe during the Flight into Egygt,” in a circle; “Chriſt preaching to the Multitude;” and “The Miracle of the Loaves and Fiſhes,” (of the oval form,) are all in folio, and after the ſame maſter; “Daniel in the Lion's Den,” and “Diana changing Actæon to a Stag,” after Th. Bernard, in folio; and “Polyphemus, Acis, and Galatea,” in ſtill larger folio, after Cornelius de Harlem.

Jacques de Ghein, the younger, was of the ſame family with the preceding artiſt, and was born at Antwerp in the year 1610. He travelled to Italy, and, as is ſuppoſed, became the diſciple of Antonio Tempeſta, whoſe ſtyle of etching he imitated with no ſmall ſucceſs: he ſometimes worked in conjunction with Coryn Boel, and marked his prints with his name at length, ſometimes with the addition of “Junior.”

Among his works may be mentioned with diſtinction, the portraits of Francis I. at the battle of Pavia, after A. Tempeſta; and that of the emperor Charles V. on horſeback, accompanied by his general officers, at the battle of Muhlberg, both in folio. He alſo engraved, in concert with Coryn Boel, the plates for “The Life of the Emperor Charles V.” after Tempeſta.

Guillaume de Ghein was alſo a native of the Low Countries, but of what part is uncertain, and was born ſome time about the year 1610. Preſumptively he was of the ſame family with Jacques. He travelled to Paris and ſtudied there, or, at leaſt, practiſed engraving, under J. de Blow, for whom he engraved two, *viz.* “Spring,” and “Summer,” of the four ſeaſons, perſonified ſomewhat ridiculouſly, by female figures attired in the French coſtume of the age of Louis XIII. Here alſo he engraved the portrait of Louis XIV. when a youth; he is repreſented on horſeback, and attired for the chaſe; and that of the duke Bernard, of Weymar, alſo on horſeback; both are of large folio dimenſions, and engraved in a ſtyle which bears ſtrong reſemblance to that of Abraham Boſſe.

Louis de Vadder was born at Bruſſels in the year 1560. He was the ſtudent of Nature alone: at leaſt he has acknowledged no other inſtructor, and no other has been recorded; and painted and etched landſcape with much ability: he was particularly ſucceſsful in his repreſentations of Morning, and often introduced the riſing ſun diſſipating the dank vapours of Night, and tinging the tops of the mountains, and other lofty objects, with golden luſtre. His ſtyle of etching is ſpirited and free, much reſembling that of Van Uden; and among his beſt prints will be found a ſmall village ſcene. The ſame ſcene, with falconers preparing to ſet forth on their morning's diverſion; and a folio landſcape, with the effect of a ſtorm; which, in addition to the name of Vadder, bears that of Vorſtermans; from which circumſtance it may be preſumed that the latter artiſt either aſſiſted in etching it, or worked upon the plate afterwards with the graver.

Gilbert van Veen, or Vænius, was born at Leyden in the year 1566, and died at Antwerp in 1628. He was the brother of Otho Vænius, a celebrated painter of portraits and hiſtory, who was the inſtructor of Rubens.

Gilbert worked with the graver only, in a ſtyle greatly reſembling that of Cornelius Cort; and from the number of engravings that he produced after the Italian maſters, it has been inferred that he travelled with Otho into Italy. His engravings are ſlight, but his outline is good; his heads expreſſive, and his hands and feet marked in a ſtyle that ſhews the ſoundneſs of his knowledge, and, as Strutt ſays, does him honour.

In the year 1612, we find him living at Antwerp, where, in the courſe of that year, he publiſhed “The Emblems of Horace,” after his brother's deſigns; and ſhortly after, a ſet of plates, of which the ſubjects are taken by Otho, from the “Life of St. Thomas Aquinas,” a meritorious work, engraved under the influence of a ſuperintending ſimplicity, perfectly homogeneous with the ſtyle of his brother's deſigns, and which ſhewed that they were brothers in mind, as well as by conſanguinity.

The principal works of this artiſt are the *Portraits* of Erneſt, duke of Bavaria, in a medallion, ſupported by Fame; John of Bologna, and Alexander Farneſe, after Otho Vænius, ſurrounded with allegorical figures, all of folio ſize.

Of his *Hiſtorical Works* may be mentioned, “The Emblems of Horace,” in quarto; “The Emblems of divine and profane Love;” and “The Life of St. Thomas Aquinas,” all after Otho Vænius; “The Four Seaſons,” from Raphael del Colle, in folio; “The Marriage of Iſaac and Rebecca,” in a frieze, compoſed of five folio plates, after Balth. Peruzzi, a very rare and capital work; “The Viſitation of St. Elizabeth,” in folio, from Baroccio; and “Our Saviour crucified, attended by the Virgin and St. John,” in large folio, after the ſame maſter.

Bartholomew Dolendo was born at Leyden A.D. 1566, and became the diſciple of Henry Goltzius. He worked entirely with the graver in an open ſtyle, ſomewhat reſembling the ſlighter works of his maſter, but was much his inferior, both as an engraver and draftſman; yet it is ſaid, that Gerard Douw learned the firſt principles of drawing from Dolendo.

He marked his engravings with one or other of the cyphers which may be ſeen in *Plate* II. of thoſe uſed by the engravers of the Low Countries, and his moſt eſteemed productions are “The Prophet Jonas thrown into the Sea,” which is companion to “The Prophet Jonas aſleep under his Gourd,” in circles; “A Dutch Village Fete,” in quarto; “Adam and Eve receiving the forbidden Fruit,” after Karl van Mander, in quarto; “Jeſus appearing to Mary Magdalen as a Gardener,” in folio, from his own compoſition; “The Holy Family,” and “St. John preaching in the Deſart,” both in folio, after M. Coxie; “Pyramus and Thiſbe,” after C. vanden Broeck, in quarto; “Jupiter and Ceres,” after B. Spranger, in large folio; and “The Aſſumption of the Holy Virgin,” alſo in large folio.

Zachariah Dolendo was born at Leyden in the year 1567, he was related to the preceding artiſt, and learned the elements of his art of Jacques de Ghein. He drew correctly, and was, in no reſpect, inferior to his maſter. We have, by his hand, a number of portraits which are equal to thoſe of

Wierix; his monogram will be found in *Plate* II. of thoſe uſed by the Low Country engravers.

From his works we ſhall ſelect the following, as being moſt worthy of eſteem:—William, prince of Orange, a half-length figure in armour, in a quarto oval, and finely engraved; "Andromeda chained to a Rock," from his own compoſition; "The Virgin ſeated on a Throne, crowned by two Angels," after Jac. de Ghein, both of quarto ſize; "The Crucifixion," in large folio, from the ſame painter; "Adam embracing Eve, whilſt ſhe receives the Apple from the Serpent," after Spranger; "St. Martin dividing his Mantle between two Beggars," from the ſame painter, in quarto; "The Continence of Scipio," a circular print, from Ab. Bloemart, both in quarto; and a ſet of "The Heathen Gods and Goddeſſes," from H. Goltzius. His naked Andromeda is a well-drawn figure, with the head and extremities marked in a maſterly ſtyle. Of the two Dolendos, who were probably brothers, it may ſafely be aſſerted, that Zachariah was the ſuperior artiſt. The time of his death has eſcaped notice: if that of his birth has been truly regiſtered by Huber, he could have been only in his fourteenth year (which is ſcarcely credible) when he produced his excellent portrait of prince William of Orange, for the print bears the date of 1581.

The family of Bloemaert attained a juſtly founded celebrity as engravers, during the period which is now under our review: for an account of them the reader is referred to the article Bloemaert, in our fourth volume.

James Matham was born at Haerlem in the year 1571. As we have already ſtated, he became the ſon-in-law and pupil of Henry Goltzius, in conſequence of his widowed mother marrying that diſtinguiſhed artiſt during the adoleſcence of James. Adviſed, no doubt, by his tutors, he travelled to Italy to complete his ſtudies, and in that country produced a conſiderable number of engravings: yet after his return he continued to work under the eye and the direction of Goltzius, and though he produced many valuable prints, they poſſeſs little originality as engravings, being executed in the ſtyle, or rather, in the *manner* of his father-in-law, whom, however, Matham never equalled in correctneſs of outline, or in taſte, or in the ſcience which enabled Goltzius to adapt his powers to the ſeveral occaſions which called them forth. In ſhort, though his manual command of the graver, which was the ſole inſtrument of his art, evinced extraordinary ſkill, yet, like moſt imitators, in ſeizing the groſſer part of the art of Goltzius, he let the eſſence eſcape. His numerous engravings, however, have been valued by moſt collectors, and are principally as follows.

Portraits.—A buſt of Philip Winghius, after H. Goltzius, in octavo; a buſt of T'leeſt al van den Velde, in an hiſtorical border, in quarto; and Nicolas Bulius, alſo in quarto; Abraham Bloemaert, in folio, after Paul Morelſen; Michael Angelo Buonaroti, in folio; Philip William, prince of Orange, after Mirevelt; and Henry of Naſſau, prince of Orange, both in large folio.

After various Italian Maſters.—"The Statue of Moſes," a ſitting figure, after Michael Angelo; and the "Statue of Chriſt," from the ſame maſter, both in folio; "A Holy Family," where the Virgin is repreſented carrying the infant Chriſt, accompanied by St. Anne, after the picture of Raphael, which was preſented to Charles II. of England, by the republic of Holland; "Mount Parnaſſus, with Apollo, the Muſes, and the Poets," both in large folio; "A Holy Family," accompanied by St. Catherine, after Titian, in folio; "The Alliance of Venus, Ceres, and Bacchus," from the ſame painter; "The Viſitation of the Virgin," a rich compoſition, after F. Salviati, in large folio; "The Saviour's Feet anointed," a circular print, after Thaddeus Zuccaro; "Chriſt on the Mount of Olives," both in folio; "The Nativity," and "The Aſſumption of the Virgin," grand compoſitions from the ſame painter, in very large folio; "The Adoration of the Kings;" "Chriſt healing the Sick;" "The Reſurrection of the Widow's Son," all grand compoſitions, after Zuccaro, of large folio ſize; and "The Viſitation," after P. Veroneſe, a circular print, alſo in large folio.

Various ſubjects, after Goltzius.—"The Fall of our Firſt Parents;" "The Holy Family," with St. Elizabeth; "Chriſt on the Croſs," at the foot of which is St. John and the Virgin; "Chriſt appearing to the Magdalen, in the Garden," all of folio dimenſions; "Jeſus at Table with his Diſciples at Emmaus;" "St. Luke painting the Virgin," in large folio; "Venus requeſting Cupid to aim an Arrow at Pluto," in quarto; "The Loves of the Gods," *viz.* 1. Jupiter and Europa. 2. Phœbus and Leucothœ. 3. Mars and Venus. And 4. Hercules and Dejanira, engraved as a ſet; "The four Seaſons," in circles; "The three Chriſtian Virtues," Faith, Hope, and Charity, all in folio; "The ſeven Cardinal Virtues," in quarto; and "The Seven mortal Sins," in folio; "The Picture of Cebes," or "The Type of Human Life," a very large compoſition, engraved on three plates, in a very fine ſtyle.

Hiſtorical, after various Painters.—"Abraham diſmiſſing Hagar," in folio; "The Annunciation," in half figures; "The Adoration of the Shepherds," all in folio; "The Parable of the Sower," with a landſcape back-ground, in large folio; "The Virgin in a Glory," and her head ſurrounded with ſeven ſtars, the crown of immortality, in folio; "St. Veronica and St. Suaire, with two Angels," in large folio; "St. Stephen kneeling;" "The Loves of Jupiter and Danae;" and "The Loves of Cupid and Pſyche," all in folio, from Ab. Bloemaert; "Sampſon aſleep on the Lap of Dalilah," after Rubens, in large folio; "The Holy Women, weeping over the dead Body of Chriſt," after Jer. Franck, in folio; "The Crucifixion," after Albert Durer, known by the appellation of "The Grand Calvary à l'accolade," large and rare; "Venus aſleep, ſurpriſed by Satyrs," after Rottenhamer, in quarto; and a ſet of five very rare prints, after Peter Van Aertſen, (called by the French Peter the Long); namely, 1. The Poulterer and Fruiterer. 2. Six Women and a Man, ſurrounded with Proviſions of all kinds. 3. The Kitchen of the wicked rich Man. 4. Jeſus and his Diſciples, in the Kitchen at Emmaus. And 5. The Toaſter; of which ſet it is very difficult to meet with good impreſſions.

Theodore Matham was the ſon and pupil of the preceding artiſt, and was born at Haerlem in the year 1600. He travelled into Italy, where he ſtudied in the ſchool of Cornelius Bloemaert, and in conjunction with him, Perſyn, Natalis, and other artiſts, he engraved the ſtatues of the Juſtinian palace. He did not work with the graver only, but ſometimes made uſe of the point; moſt of his works conſiſt of portraits, many of which are executed in a manner which does honour to the artiſt; among his works we ſhall mention the following as being moſt worthy of the notice of the collector.

Portraits.—Michael le Blon, agent of the queen of Sweden, after Vandyke; Jooſt van de Vondel, a Dutch poet, after Sandrart; Jodocus Larenus, a reforming miniſter; Vopiſcus Fortunatus Plempius, doctor of medicine; D. Gerardus Voſſius, Canonicus Cantuarienſis, after Sandrart;

Caſpar Barlæus, doctor of medicine; four fine portraits, after John Spilberg; *viz.* 1. Philip William, count palatine of the Rhine; 2. Wolfgang William, count palatine; 3. Catherine de Medicis, and 4. Stephen Vacht, dean of Sarten; Claude Saumaiſe, after Dubordieu; Henricus Regius, Philoſ. et Med. from H. Bloemaert, all of folio ſize; and D. Leonardus Marius Grezanus, in large folio, from Moyart.

Hiſtorical, &c.—“The Virgin and Child, with St. John,” after Baſſan; for the collection of engravings from the pictures in the cabinet of M. Reynot; “A Holy Family,” a grand compoſition, after Joachim Sandrart, in large folio; “Sainte Begga, the Daughter of Peſſin, duke of Brabant,” from Van Eyck, in folio; “Actæon metamorphoſed into a Stag,” in folio; “The Body of Chriſt, taken from the Croſs by St. John and Joſeph of Arimathea,” a very large plate; and “The Allegory of Virgil,” from Jooſt van Vondel, in quarto.

Adrian Matham was alſo of Haerlem, related to Theodore and James, and born ſome time about the beginning of the ſeventeenth century, but he was, on the whole, inferior to thoſe artiſts in merit. He worked with the graver only, imitating the elder de Ghein, but was always behind him, nor can it be neceſſary to dwell on his demerits.

He engraved part of the plates for the large folio volume, which was publiſhed at Antwerp in 1628, and entitled “Academie de l'Eſpée;” “The Golden Age,” from Goltzius, in large folio; “An old Man preſenting his Purſe to a young Female,” (a large upright) from the ſame maſter; “A Group of itinerant Muſicians,” after A. Vander Venne, in folio; “A Combat between ſix groteſque figures, with culinary Implements,” from the ſame painter: his other works are leſs worthy of notice.

He alſo engraved portraits, among the beſt of which are thoſe of Pieter Bor Chriſtiaenſz, a Dutch hiſtorian, after Frank Hals; and D. Sibrandus Sixtius Oiſtervirius, after N. Moyart, both in folio.

Herman Muller was a native of Holland, but we know not the preciſe time or place of his birth. If he frequented the ſchool of Henry Goltzius, which appears very doubtful, though it is aſſerted by Strutt, it muſt have been before the peculiar ſtyle of that artiſt was formed, and conſequently before his migration to Italy. He worked in conjunction with Cornelius Cort, in the earlier part of the career of that artiſt, for Jerome Cock. The ſole inſtrument of his art was the graver, which he handled with tolerable preciſion, but not much freedom; and in his beſt works his drawing is performed with care. In his later works, he aimed at the bold and free ſtyle of Goltzius, which had by this time excited the ſurpriſe of moſt of his contemporaries and the admiration of ſome, but in this endeavour our artiſt was not very ſucceſsful.

His engravings are numerous and not uncommon; they are marked with one or other of the three monograms, for which ſee our *Plate* II. of thoſe uſed by the engravers of the Netherlands. Among them may be diſtinguiſhed “The three Deſtinies,” and “Cleopatra,” after Cornelius de Harlem; “Lucretia,” after C. Kettel, (an upright) “St. Cecilia,” in which plate it may be ſeen he has attempted to embolden his ſtyle. A ſet of four of “The Cardinal Virtues,” after Martin Hemſkerk; another ſet of “The ſix Commandments of God,” illuſtrated by ſubjects from bible hiſtory, from the deſigns of the ſame painter, and ſome other bible ſubjects which range in ſets, with certain works from the gravers of the Sadelers and Galles, from J. Stradan and M. de Vos, of various folio dimenſions.

John Muller, of the ſame family, was an artiſt of more vigorous powers. He was born in the year 1570, as is ſuppoſed at Amſterdam, but how he ſtood related to Herman is not known. His vigour, however, as an artiſt, was not wiſely employed, like that of an Hercules; but rather extravagantly laviſhed; he ſwaggered like a giant of romance. Studying under Henry Goltzius at his worſt period, he learned to exceed even his exceſſes. He caught the enthuſiaſm of that great artiſt, but fell ſhort of him in judgment and variety. “The modeſty of Nature,” was with Muller as with Spranger, entirely out of the queſtion, and the more he could “Out-herod Herod” in his manual execution and ſtyle of deſign, (eſpecially when engraving after Bartholomew Spranger,) the better he appears to have pleaſed himſelf.

Hence ſome of his extravagancies are ſcarcely leſs ludicrous than others are ſeriouſly ſurpriſing. Watelet ſays of him, that “he handled the graver with the greateſt freedom, and will ever be worthy of the attention of thoſe artiſts who wiſh to diſtinguiſh themſelves in the mechanical part of engraving; but they muſt learn to ſubdue the audacity of his ſtyle. It is very difficult to employ leſs work than Muller, in rendering the textures of objects, and he always worked his plates up to a good tone. He underſtood the human figure well, but from engraving much after Adrian van Vries and Bartholomew Spranger, acquired a mannered habit of drawing, which particularly diſcovered itſelf in his hands and feet.”

To this eſtimate of his merits, Strutt adds, “the facility with which he handled the graver, for he worked with that inſtrument only, cannot be ſufficiently expreſſed; his works muſt be ſeen to convey a proper idea of it to the mind, yet if in freedom of execution he equalled his maſter, in every other requiſite he fell far ſhort of him,” &c.

That Solomon Muller was of the ſame family with Herman and John, as Strutt has conjectured, appears very doubtful, if not altogether an error. He ſometimes wrote his name Miller, and is ſo utterly deſtitute of the talent and enthuſiaſm of the Mullers, that he appears, from his ſmall Bible prints, which were produced about the period now under our review, rather to have copied the worſt of the Wierixes, with equal neatneſs, but with deeper dulneſs.

Of the engravings of John Muller, the moſt diſtinguiſhed are the

Portraits of Bartholomew Spranger, a kindred ſpirit, whom Muller terms, in the inſcription beneath, “M. Pictor celeberrimus,” it is dated in 1597, is in folio, and after Joab ab Ach; Eyerhardus Reidanus, comitis Guilhelmi Naſſavoy Conſiliarius; Maurice, prince of Orange; John Neyen, of Antwerp, laying his hand on a ſkull; Ambroſe Spinola, the celebrated general, in large folio, both from Mirevelt; Chriſtian IV., king of Denmark, from Iſacks; Albert, archduke of Auſtria, from Rubens, and its companion, Iſabella, infanta of Spain, from the ſame painter, in large folio.

Subjects from his own Compoſitions.—“The Baptiſm of Chriſt, celebrated in Heaven,” in folio; “An Ecce Homo,” ſurrounded by angels, a circular plate, in large folio; “Balthaſar's Feaſt,” and “The Adoration of the Kings,” two very capital plates, in large folio, very much ſought after by connoiſſeurs; “Chilo, the Spartan Philoſopher,” and “Harpocrates, the God of Silence;” two heads as large as life, engraved in a very bold, vigorous ſtyle.

Subjects from various Maſters.—“Hagar in the Deſart, comforted by an Angel,” in quarto; “Lot and his Daughters,” in large folio, almoſt ſquare; “The Nativity,” with eight Latin verſes, in large folio; “The Holy Family,” attended by two angels, in folio; “A young Hero, conducted by Hercules and Scipio to the Temple of Glory,” in quarto; “Venus attended by Nymphs and Satyrs,” in folio; “A Satyr dreſſing the wounded Foot of a young Fawn,” in quarto; “Venus and Mercury,” with four Latin verſes, in folio; “Ceres, Bacchus, and Venus, before a Fire,” in large folio; “Mercury and Minerva arming Perſeus,” a very fine engraving, in large folio; “The Goddeſs Bellona,” engraved on two large plates, and dedicated to the archduke Matthias; “Pſyche contemplating Cupid aſleep,” in large folio, all from B. Spranger; “The Reſurrection of Lazarus,” after Ab. Bloemart, a very capital print; “The Murder of Abel,” after Cornelius of Haerlem; “The Diſcomfiture of Irus, before the Suitors of Penelope,” in large folio; “Arion mounted on a Dolphin,” in large folio; “Fortune diſtributing her Gifts,” a large and grand compoſition, engraved on two plates, all from Cornelius of Haerlem; “The Martyrdom of St. Sebaſtian,” after Jean von Achen; a very large engraving, performed on three plates, of “The Rape of the Sabines,” from a compoſition in wax by Adrian van Uries; “Mercury and Pandora,” in large folio, from a group in bronze, by the ſame extravagant artiſt; and a ſet of ſeven circular plates, entitled “The Works of Creation,” after Henry Goltzius.

Paul Moreelſe, or Moreelſen, was born at Utrecht in the year 1571, and died in the ſame city in 1638. He ſtudied painting under Michael Mirevelt, whom he ſoon equalled, and ſucceeded in portraits, hiſtorical ſubjects, and architecture; the latter is ſufficiently teſtified by the gate of St. Catherine, in the city of Utrecht, which was built from his deſign. He ſtudied during ſome time in Italy, and we have by him ſome excellent wood cuts in chiaroſcuro, executed on three blocks; the firſt for the outline, which is cut in a very ſpirited ſtyle; the ſecond for the dark ſhadows; and the laſt for the demi-tints. Theſe prints have a light airy appearance, the hatchings by this artiſt being performed with great delicacy. They are drawn in a ſlight, but maſterly manner, and the union of the ſeveral tints produces an agreeable effect. He uſually marked his plates with a monogram, which will be found in our ſecond plate of thoſe uſed by the engravers of the Low Countries.

Of the engravings on copper by this artiſt we are only able to ſpecify the two following, which are both in folio. “Cupid with ſeveral dancing Figures,” and “The Death of Lucretia.”

John Saenredam was born at Leyden in the year 1570. He ſtudied the elements of engraving ſucceſſively under Henry Goltzius and James de Gheyn. Poſſeſſed by the infatuation in favour of clear and ſleek lines, which was faſhionable at the time, he appears never to have reſorted to etching, but executed his plates, which are ſomewhat numerous, with the graver alone. He handled that inſtrument, however, with great facility, and his ſtyle is at once free, clear, neat, ſoft, and delicate, but his chiaroſcuro is deficient in vigour.

He appears to have underſtood drawing better than he always practiſed it, as may be ſeen by comparing the plates which he has engraved after his own compoſitions, with thoſe which he has executed after pictures by other maſters. The outlines in the former are generally much more correct, and they are for that reaſon ſought after by connoiſſeurs with more anxiety.

Some of his prints are large. Their number is eſtimated by Florent le Comte at one hundred and thirty-two, which they probably ſomewhat exceed: among them we ſhall mention the following as being moſt worthy of the notice of the collector. The artiſt uſually affixed to them one or other of the two monograms, given in our ſecond plate of thoſe uſed by the engravers of the Netherlands.

Portraits.—Carl van Manden, after Goltzius, in quarto; John Céſarée, painter and philoſopher, a rare print, in folio; John de la Chambre, writing maſter, after Franc. Hals; and Peter Hogebert Hornanus, a poet and phyſician, ſurrounded with allegorical figures, after C. van Manden, both in folio.

Subjects from his own Compoſitions.—“Suſannah and the Elders,” a ſmall oval; “Deborah ſtanding at the Foot of a Rock,” perhaps ſinging or meditating her celebrated canticle, in folio; “Hercules, between Minerva and Venus,” a folio print, nearly ſquare; “Lycurgus giving Laws to the Spartans,” and exemplifying the advantages of good education, from the habits of two dogs, in folio; “The wiſe and fooliſh Virgins,” on five plates, with nine Latin verſes; very capital, and executed in ſo delicate a ſtyle, that the plate ſoon wore under the hand of the printer, and it is therefore difficult to meet with a good impreſſion; in folio. A large allegorical ſubject, relating to the government of the ſeven United Provinces under the houſe of Orange, repreſented by a proceſſion attended by Concord and other political virtues, in large folio. Another allegorical ſubject, relating to the government of the Low Countries by the infanta Iſabella. That princeſs herſelf is repreſented ſtanding under a tree on the right hand. Both very rare prints. And a repreſentation of a large whale, which was thrown upon the coaſt of Holland, with thirty-two Latin verſes; a very fine and rare print.

Subjects after various Painters.—“The Fall of our firſt Parents,” in quarto, after Henry Goltzius; “Lot and his two Daughters,” in folio; “Judith with the Head of Holofernes;” “Suſannah ſurpriſed by the Elders;” The ſix penitent women of the New Teſtament, *viz.* 1. Mary Magdalen. 2. The Woman of Samaria. 3. The Woman of Cana. 4. The Woman taken in Adultery. 5. The Woman with the Hemorrhoids. And 6. The paralytic Woman: with Latin explanations; in quarto. A ſet of three, 1. Ceres, worſhipped by Labourers; 2. Venus, worſhipped by Lovers; and 3. Bacchus, worſhipped by Drinkers, in large folio; very fine and rare prints. “The Union of Ceres, Bacchus, and Venus,” in folio; “Venus and Cupid,” in quarto; “Diana, with her Nymphs,” in a ſet of three plates, each containing two figures; “Diana diſcovering the Incontinence of Caliſto;” “Andromeda delivered by Perſeus;” “The Five Senſes,” in quarto; “The Seven Planets;” the three marriages, *viz.* “The Marriage for Intereſt;” “The Marriage for Paſſion,” and “The Marriage of true Affection,” in quarto; a painter drawing the portrait of a female kneeling before a mirror, known by the name of “The Painter,” in folio; all from Henry Goltzius. “The Life of Adam and Eve,” after Abr. Bloemart, on ſix plates, in folio. The hiſtory of the prophets Eliſha and Elijah, four folio plates. “Elijah with the Widow of Sarepta;” “The Annunciation of the Shepherds,” both in large folio; “The Prodigal Son,” with a landſcape background, in folio; “Vertumnus and Pomona,” and “The Rape of Ganymede,” both in large folio; all from Abraham Bloemart. “Mars and Venus,” with four Latin verſes, from P. Iſaacs, in quarto; “The Bath of Diana,” from Moreelſen, commonly called “The Great Bath of Diana,” to diſtinguiſh it from the former one after the compoſition of Saenredam himſelf; “Judith putting the Head of Holofernes in a Bag held by her Servant,” in folio, from Lucas of Leyden; “Deborah nailing the Head of Siſera,” in folio, from the ſame painter; “The Meeting of Eleazar and Rebecca,” after Carl van Mander, in large folio; “David with the Head of Goliah” on his ſword, from Lucas of Leyden; “The Daughter of Herodias dancing at the Feſtival of Herod,” after C. van Mander; “The Nativity,” a grand compoſition; and “Paul and Barnabas refuſing the Sacrifice of the Inhabitants of Lyſtra,” a grand compoſition, all in large folio, after the ſame painter; “Adam and Eve in the terreſtrial Paradiſe,” in folio, from Cornelius of Haerlem; “Suſannah and the Elders;” “St. John preaching in the Wilderneſs;” “Paris and Oenone cutting their Names on the Bark of a Tree;” “Angelica and Medora engraving their Names on a Beech Tree;” “Vertumnus and Pomona;” all in folio, from the ſame painter. “The Grotto of Plato,” a celebrated parable, ſhewing that moſt mortals prefer darkneſs to light, with twelve Latin verſes, from C. of Haerlem, in large folio; a very fine print, both in compoſition and execution. A wounded general, carried by his ſoldiers, formerly ſuppoſed to be Scipio, but as the coſtume of the figures is Grecian, and not Roman, it is more probably “The Death of Epaminondas;” it is engraved after a drawing by Goltzius. “The Redemption of Rome by the Dictator Camillus,” after a drawing by Goltzius; both of folio ſize. In the latter print, the characters of the Romans and Gauls are finely contraſted. A ſet of eight folio plates, dedicated to the duke of Aqueparte, of “The Hiſtory of the Unfortunate Niobe and her Children,” from the drawings of Goltzius after Caravaggio; with Latin verſes, very rare. The pictures form a frieze in the palace of Buffal, at Rome. “The Entombing of Our Saviour,” after Michael Angelo; and “Our Saviour at the Houſe of Levi the Publican;” executed on five plates, from the pictures of Paul Veroneſe in the church of St. Paul at Rome, of large folio ſize, and very rare.

Peter Serwouters, or Sherwouter, was born at Antwerp in the year 1574, where he always reſided. He worked in a clear neat ſtyle with the graver only, but without much taſte. His plates are not ſufficiently finiſhed to produce a pleaſing effect, nor accurate enough to bear critical examination.

From among his works, which are not numerous, the following may be diſtinguiſhed as leaſt unworthy of the notice of the collector. A ſet of ten ſubjects of Chaſes, after D. Vinckenbooms, in ſmall folio, lengthways; “The Fall of our firſt Parents,” of which the artiſts of the Netherlands appear to have thought their countrymen could not be too often reminded. In the preſent inſtance, French and Dutch verſes lend their aid in impreſſing the religious leſſon, and the whole forms a large folio print. “Sampſon killing the Lion;” “David killing the Bear;” and an emblematical plate, repreſenting in the front a Dutch merry-making, with figures dancing, and a cottage in the back-ground, from the door of which a man and his wife are iſſuing forth to oppoſe a man with a drawn ſword; all in folio, from the ſame painter. Serwouters alſo engraved part of the plates for Thibault's “Academie de l'Eſpée,” in folio, publiſhed at Antwerp A. D. 1628. The monogram which this artiſt ſometimes affixed to his prints will be found in *Plate* III. of thoſe uſed by the engravers of the Low Countries.

John von Londerſeel was born at Bruges in the year 1580. He worked entirely with the graver, in a ſtiff dry ſtyle, greatly reſembling that of Nicholas de Bruin, whoſe diſciple he probably was. However, his prints are not without ſome ſhare of merit; and are ſought after by connoiſſeurs.

He marked his plates in various ways, ſometimes with his initials, combined as in our *Plate* IV. of the monograms, &c. uſed by the engravers of the Low Countries, or, at other times, J. Lond. or J. Londer fec. Among his works, we ſhall ſelect the following as being moſt worthy of the attention of the collector. The theological virtues, Faith, Hope, and Charity, perſonified by female figures, with a landſcape back-ground; the Five Senſes characteriſed by figures, ſeated in a landſcape, both in large folio, and apparently from his own deſigns. A woody landſcape with hunters; and one with the fable of Apollo and Daphne, both in folio, from Jac. Savery; “The diſobedient Prophet devoured by a Lion;” “Tobit journeying with the Angel;” “Jacob tending the Flocks of Laban,” with landſcape back-grounds; “St. John in the Wilderneſs,” all in large folio, and after G. Hondecoter; “The good Samaritan;” “The blind Warrior;” “The Woman with the Hæmorrhage;” and “Abraham ſacrificing Iſaac,” all after Giles Coninxloo. A perſpective view of the interior of the church of St. John de Lateran at Rome, after Hendrick Arts, (a painter with whoſe name we are otherwiſe unacquainted.) The following are all after D. Vinckenbooms; “Saul anointed King of the Hebrews;” “The Rape of Tamar;” “The Prophet foretelling to Jeroboam the Diviſion of his Kingdom;” “Suſannah ſurpriſed by the Elders;” “The Temptation in the Wilderneſs;” “The Saviour praying on the Mount of Olives;” “The Maries approaching the Holy Sepulchre;” “Diana and Actæon;” and “The Pleaſures of Summer.” The latter is a meritorious landſcape, and they are all of large folio ſizes.

John Bara, or Barra, was a native of Holland, born A.D. 1572. He emigrated to England, and in the year 1624 was reſiding in London. His ſlender talents, however, merit not much attention. His inſtrument was the graver, and that only: his *work* may be truly ſo termed, being entirely without the vivaciouſneſs of art, and characterized by all the tameneſs and coldneſs of manual labour, in which reſpect the worſt imitator of the worſt of the Sadelers did not outdo him.

Of the engravings of Barra, it may be quite ſufficient to mention the

Portraits of prince Maurice of Naſſau and Orange; Charles II., elector of Saxony; Joachim, count of Ortemberg; and Lodovicus, duke of Richmond and Lenox, the latter of which was engraved in this country.

Hiſtorical Subjects, &c.—“Phaeton's fatal Requeſt to Apollo,” introduced in a landſcape, of folio ſize. Four other landſcapes in quarto, in which are introduced the pilgrims to Emmaus, and different events in the hiſtory of Tobit. Two hiſtorical landſcapes from the ſtory of “Suſanna and the Elders;” “The Parable of the Sower;” “Herodias receiving the Head of John the Baptiſt,” all in quarto. The laſt ſubject is from J. van Achen. “Time and Truth” is from Paulus ab Eſtatis, and is a ſmall upright, as is alſo “Bathſheba at the Bath.”

Nicholas, or Claus Coeck, is ſcarcely more worthy of notice than him whom we have juſt diſmiſſed. He was of Leyden, born in the year 1576, and, according to the baron Heinneken, ſtudied under Frank Floris, though his engraving appears rather to contradict this, and to point to Cornelius Cort as his maſter.

Of his works, which are not numerous, it may be ſufficient to name “The Four Elements,” perſonified by half-length figures, and “The Judgment of Midas,” all after Carl van Mander, and of folio dimenſions.

Giſbert van Breen, or Van Brecht, was born in Holland ſome time about the year 1576. He worked entirely with the graver, and is ſuppoſed to have been the diſciple of

James de Gheyn. His engravings are not deſtitute of merit, though inferior to thoſe of his maſter.

From among them the connoiſſeur may with advantage ſelect the *Portraits* of James I. of England, his queen, and the young prince of Wales, on the ſame (folio,) plate. A ſet of ſix ſmall prints of "The Life of a Libertine," preſumptively from his own compoſitions. "The Marketers with Fowls and Eggs," after Clauſe Coeck; "Envy ſtripping the Clothes from the Back of a Lady," after the ſame author, both in ſmall folio. A ſatirical print, wherein certain perſons are buſily employed in waſhing an angry jack-aſs. A pair, in the firſt of which two young libertines are diſſipating their wealth, and in the ſecond are reduced to want and miſery, in quarto, and after Van Mander. An inſtrumental concert, after Sbraſſen. A ſet of ſmall friezes of ſea-ports, with ſhipping, &c. after C. Nicolai.

Whether the Nicholas, or Claus, Braen or Breen, who is mentioned by Baſſan, was related to the preceding artiſt, we know not. They have by ſome writers been confounded together; but Nicholas appears to have been of the ſchool of Saenredam, and was the author of a ſet of four ovals from compoſitions by himſelf, of which the ſubjects are, Samſon, Siſera, Judith, and David, (David is here the ſtripling, and bears the head of Goliah). He alſo engraved "A Penitent Magdalen," after James Matham, in folio; and "Chriſt conducted to Calvary," alſo in folio, and after Tintoretto.

William van Swanenbourg, or Swanenburch, was born at Leyden in the year 1581. He was the diſciple of Saenredam, and did honour to his maſter and himſelf, by the freedom and vigour of his engraving. Abram Boſſe recommends his prints to ſtudents in the art, on account of the beauty of his touch: yet it muſt be confeſſed that the drawing of Swanenbourg is mannered and defective; and if ſtudents ſhould imitate, where it is applicable, the boldneſs of his handling, and his dexterity of touch, they ſhould aſpire to purer delineations of form.

He affixed to his engravings a monogram, for which, ſee *Plate* II. of thoſe uſed by the engravers of the Netherlands.

We ſhall ſpecify the following prints from the graver of Swanenbourg, as being moſt worthy of the attention of the connoiſſeur.

Portraits.—Abraham Bloemart, in an ornamented border; Janus Hautenus, ſecretary of Leyden, both in 4to.; Daniel Heinſius, profeſſor of Leyden; John Heurnius, doctor of medicine at Leyden; John William, duke of Cleve; Maurice, prince of Orange and Naſſau; Erneſt Caſimir, count of Naſſau, from P. Moreelſen, in large folio; and Petrus Jeanninus, eques, hanc maximi viri effigiem ex vultu expreſſit Michael Mirevelt, &c. in folio.

Hiſtorical, &c. after various Painters.—"Jacob defrauding his Brother out of Iſaac's Bleſſing;" and "The Reſurrection of Our Saviour," both from P. Moreelſen, in large folio. A ruſtic feſtival at the entrance of a village, after Vinckenbooms, in large folio. "The Judgment of Paris," from M. Mirevelt; "Perſeus reſcuing Andromeda," after Saenredam, in folio; "The Adoration of the Shepherds," after Abr. Bloemart, in ſmall folio; "The Six Penitents," in folio, *viz.* Saul, St. Peter, St. Paul, Zaccheus, Judas Iſcariot, and the Magdalen. "St. Jerome in the Wilderneſs;" "The Repentance of St. Peter." Three ſubjects emblematical of Piety, Riches, and Vanity, in ſmall folio, all from Bloemart. "Lot and his Daughters;" and "Jeſus at Table with the Pilgrims at Emmaus," both from Rubens: and a ſet of fourteen, commencing by "Jeſus Chriſt carrying the Croſs," and ending with "The Laſt Judgment," entitled "Thronus Juſticiæ. Hoc eſt optimus Juſticiæ tractatus electiſſimis quibuſque exemplis judiciariis aeri inciſis illuſtratus. Joachim Uytenwael, pinx. G. Swanenburch, ſculp. 1605, 1606."

Cornelius Boel was born at Antwerp in the year 1576. He was of the ſame family with Peter Boel, the eminent painter of animals and flowers, but ſtudied engraving apparently in the ſchool of the Sadelers. He made little uſe of any other inſtrument than the graver, which he handled with ability in a clear and neat ſtyle.

Boel engraved a ſet of ſmall oval plates for the fables of Otho Vænius, which were inſcribed with Latin, Engliſh, and Italian verſes, and publiſhed at Antwerp in 1608. "The Laſt Judgment," from a compoſition by himſelf, in ſmall folio, and the portrait of Henry, prince of Wales, in an ornamented border, and of quarto ſize.

From this latter plate, and the inſcription beneath the frontiſpiece to the large folio Bible, which was publiſhed here by royal authority in the year 1611, which inſcription runs, "C. Boel fecit, in Richmont;" it is inferred that our artiſt viſited England about the middle period of his life. But his principal and great work was a ſet of eight large plates, from Antonio Tempeſta, of which the ſubjects are "The Battles of Charles V. with Francis I."

The family of Hondius or de Hondt was numerous, and ſome of them of diſtinguiſhed merit in the arts. Joſt, or Jodocus, was the ſon of Oliver Hondius, a very ingenious artiſt of Ghent, where, in the year 1563, our artiſt was born, and where he paſſed his youth in the ſucceſsful ſtudy of ſome branches of the mathematics; but the inteſtine commotions which agitated that city, about the period that Joſt attained the age of manhood, occaſioned him to ſeek refuge in England.

Here he followed various purſuits, as various occaſions called forth and developed the variety of his talents. He made mathematical inſtruments, fabricated types for letterpreſs printing, and engraved maps and charts. Here alſo he married in the year 1586, and had ſeveral children. He afterwards removed to Amſterdam, and died there A.D. 1611.

Jodocus alſo engraved a few portraits, which are neatly executed, though in other reſpects their intrinſic merit is not conſiderable: among them are the celebrated Engliſh navigators, Thomas Cavendiſh and ſir Francis Drake. The latter is a large plate, and is commended by Strutt.

From an artiſt, however, ſo variouſly employed as Hondius was, no man expects exquiſite engravings; the place of his reſidence being England, and the time, the cloſe of the fifteenth and the commencement of the ſixteenth centuries. He ſometimes marked his plates with the cypher, which may be ſeen in *Plate* III. of thoſe of the engravers of the Low Countries; and at others, with a *hound* barking, and inſcribed "ſub cane vigilante;" which hound is, in fact, a pun upon his family name.

Beſide what we have mentioned above, Jodocus engraved the charts for Drake's Voyages, and ſeveral of the maps for Speed's Collections, in large folio, which latter are in general embelliſhed with figures; and Florent le Comte mentions, among the works of this engraver, a large perſpective view of London, publiſhed at Amſterdam in 1620; but Strutt very reaſonably infers a miſtake either in the engraver's name, or the date of this print.

Henry Hondius the elder, ſo called in contradiſtinction to him of whom we ſhall ſpeak hereafter, was born at Duffel in Brabant, A.D. 1576, and died at the Hague in 1610. Whether he was the ſon or brother of Jodocus has been diſputed, but is not known.

He appears to have ſtudied in the ſchool, and to have contracted the ſtiffneſs of Jerome Wierix, but poſſeſſes not his correctneſs. His principal engravings are the

Portraits of Cornelius Cort, Henry de Cleve, Giles Coninxloo, and Hans Holbein, (all painters;) John Bugenhagen, Philip Melancthon, John Wickliffe, John Knox, John Calvin, and Jerome Savonarole, (celebrated reformers,) all in 4to.

Hiſtorical, &c.—“The Judgment of Solomon,” and “The Woman taken in Adultery,” both after Carl von Mander; “A Flemiſh Recreation;” a ſet of five engravings, repreſenting the celebration of St. John's day, at Meulebeck, near Bruſſels, by healing the ſick, both from P. Breughel the droll; and “Muſarum Officia,” or the Muſes giving a concert on mount Parnaſſus, an agreeable compoſition, though the expreſſion of the heads is rather common, after Th. Zucchero, all of folio dimenſions.

Henry Hondius the younger is, with better reaſon than Henry the elder, believed to have been the ſon of Jodocus, and to have been born in London,—according to Huber,—in 1580, which is unfortunately four years before,—according to Strutt,—his father was married. He is ſuppoſed by Strutt to have ſtudied under his father, and to have applied himſelf with diligence to the art of engraving. His prints are neat, but diſcover little art.

Beſide finiſhing ſome plates which had been begun by Jodocus, the following are enumerated among his works.

Portraits of Bernard, duke of Saxe Weymar, in folio; a large head of queen Elizabeth; James I. of England, dated 1608; William, prince of Orange, after Alex. Cooper, dated 1641; Ferdinand, emperor of Germany, in 4to., dated 1634; and ſir Francis Drake, in folio.

Landſcapes, hiſtorical Subjects, &c.—A ſet of the four ſeaſons, after Paul Bril, dated 1643; another ſet of the four ſeaſons, conſiſting of landſcapes, adorned with various architecture, after P. Stephani, both in folio; a ſet of twelve landſcapes of the months of the year, in which are introduced ſeaſonable occupations and diverſions, in large folio; two prints repreſenting drunken peaſants, with landſcape back-grounds; two groteſque ſubjects of fools, &c. both after P. Breughel; “Chriſt going to Emmaus;” and “The Shipwreck of St. Paul,” a companion to the former, both from Giles Moſtaert, all of folio ſize; “Tobit fiſhing, attended by an Angel;” “St. John the Baptiſt preaching in the Wilderneſs;” and a view of the Hague, a rare print, all from Giles de Saen, in large folio.

The younger Henry viſited Holland about the time of his arrival at manhood, or a little before, and reſided at the Hague. Here he engraved the view of that town, which we have mentioned above; and here, in the year 1600, was born his ſon William or Guillaume Hondius.

William acquired the rudiments of engraving under his paternal roof; from whence he removed to Dantzic, and to the Hague, and became diſtinguiſhed by the merit of his portraits, of which he engraved a conſiderable number.

His cypher may be ſeen in *Plate* III. of thoſe of the engravers of the Low Countries; and his moſt remarkable portraits are thoſe of himſelf, after Vandyke, with the addition of “Chalcographus Hagæ Comitis;” Francis Frank the younger, painter of Antwerp, after the ſame maſter, both in folio; prince Maurice of Auſtria, an excellent print, probably from a drawing by Hondius himſelf; Ladiſlaus IV. of Poland, inſcribed “W. Hondius fecit 1637;” Theodore ab Werden Burgio; Berhard, duke of Saxe Weymar, all preſumptively drawn by himſelf; Henry Cornelius Longkius, after Mytens; Jean Caſimir, king of Poland; Charles, prince of Poland and biſhop of Breſlau, both after D. Scultz; and Louiſa Maria de Gonzague, queen of Poland, after Juſte d'Egmont, bearing the name and addition of “Wilhel Hondius Chalcographus Regius,” from which it appears that our artiſt enjoyed the honour of being engraver to the king of Poland.

Abraham Hondius, the juſtly celebrated painter of animals, was of the ſame family with the preceding artiſts; for whoſe biography and general merit as an artiſt, ſee HONDIUS, ABRAHAM. He etched a few plates in a ſlight, ſpirited, and painter-like ſtyle, yet with ſome degree of neatneſs, of which the ſubjects are the huntings of various beaſts of chace; theſe afford very ſtriking examples of animal expreſſion, eſpecially when their paſſions are rouſed to fury. His folio prints of “A Boar Hunt,” and “The Chace of a Wolf,” are, in this reſpect, admirable works, and are probably his beſt productions in this mode of art.

With the ſixteenth century aroſe the genius of Rubens, which has gilded the fine art of the Netherlands with unfading glory, and even tinged with its radiance the ethics and theology of Europe. His biography and extraordinary merits as a painter will be treated under the article RUBENS, *Sir* PETER PAUL. He etched a few plates, of which the merits are not tranſcendental, though they evince the powerful and free hand of a maſter; but he effected a revolution in painting, and indeed may be ſaid to have given a new conſtitution, more eſſentially free than that which preceded it, to the arts of his country, as our ſubſequent pages, devoted to the progreſs of engraving in the Low Countries, will atteſt.

The etchings of Rubens are performed in a ſlight and bold ſtyle, from his own compoſitions: “St. Francis d'Aſſize receiving the Stigmata,” in 4to.; “The penitent Magdalen,” ditto; “St. Catherine,” with the inſtruments of her martyrdom, &c. deſigned for a ceiling, and one of the beſt of the etchings of Rubens, of folio ſize; “The communication of Light,” a ſmall upright: the plate being afterwards finiſhed with the graver, either by Paul Pontius or Lucas Vorſterman, impreſſions of the etching, as it came from the hand of Rubens, are exceedingly rare and valuable. The compoſition conſiſts of a boy lighting a candle at another, which is held by an old woman. Theſe, and the portrait of an Engliſh miniſter, a ſmall head, in an oval border, are all the prints with which we are acquainted, proceeding from the etching-needle of this very diſtinguiſhed maſter.

With the vigorous and original powers of Rubens, cooperated by the fine taſte of Vandyke, and rouſed by the trumpet that ſounded forth their fame, Bolſwert, the Vorſtermans, and Pontius girded their loins, and leaped forth candidates of high enterpriſe and extraordinary promiſe, in the race of hiſtorical and portrait engraving.

The beſt of the engravers of Italy, with Marc Antonio at their head, had added truth of character to exquiſite purity of outline. The heroes of the German ſchool, led on by Martin Schoen and Albert Durer, had expreſſed the textures of the various ſurfaces or ſubſtances which adorn the face of nature, with nice diſcrimination; and had made ſome ſucceſsful approaches toward a vigorous and harmonious chiaro-ſcuro. It remained for Bolſwert, Pontius, and the Vorſtermans, the champions of the Netherlands, to poſſeſs themſelves of their trenches, and complete the circumvallation of engraving: and this they accompliſhed, aided by the commanding judgment and exquiſite taſte, and ſtimulated alſo by the ſucceſsful example, of Rubens and Vandyke.

To deeper and richer tones than had heretofore been produced,

duced, they added a talent of rendering local colour in the abſtract, which they poſſeſſed and exerciſed in enviable perfection.

Lucas Vorſterman the elder was born at Antwerp, A.D. 1580, and at firſt ſtudied painting in the ſchool of Rubens; but, counſelled by his maſter, who had remarked the true bent of his genius, he quitted the pencil for the graver. He greatly diſtinguiſhed himſelf as an engraver before he quitted the Low Countries, in particular by the production of his print of “The Adoration of the Eaſtern Kings,” after Rubens; which is pronounced by Huber to be one of the fineſt engravings that was ever executed, and is indeed a print of tranſcendent merit. But Vorſterman is of the number of thoſe artiſts who were attracted to the court of London, by the taſte and patronage of Charles I.; and as he contributed largely to the advancement of Engliſh engraving, the reader will find ſuch of the ſubſequent events of his life, as are of importance to art, detailed, and accompanied by a general eſtimate of his merits, in our account of the *Origin and Progreſs of* ENGLISH *Engraving*. A more copious liſt of the beſt works of ſo diſtinguiſhed an artiſt than we were then enabled to offer, is now ſubmitted to the admirers of legitimate engraving.

Lucas commonly ſigned his plates with a cypher, for which ſee *Plate* III. of thoſe uſed by the engravers of the Low Countries.

Portraits after Vandyke.—Peter de Jode; Charles de Mallery; James Callot; Theodore Galle; Wenceſlaus Coeberger; Deodatus del Mont; Peter Stevens; John Van Mildert; Hubertus Vanden Eynden; Lucas Van Uden; Cornellius Sachtleven; Horatius Gentileſcius; and John Livens, all diſtinguiſhed artiſts, in folio; Iſabella Clara Eugenia, infanta of Spain; Gaſton, of France, duke of Orleans, brother to the king of France; Ambroſius Spinola, governor-general of the Low Countries; Wolfgang William, count palatine of the Rhine, and duke of Bavaria; Francis of Moncade, count of Oſſona; Nicolas Fabricius, of Peireſe; Alfonſo Perez de Vivero, count of Fuenſalds; Thomas Howard, earl of Arundel, all of folio dimenſions; Nicolas Roccokxius, an amateur of Antwerp; one of the fineſt portraits of Vorſterman, in large folio.

Portraits after various other Maſters.—A buſt of Plato, after an antique marble; buſt of Seneca the philoſopher, alſo after an antique; a pair of Coſmo of Medicis, and Lorenzo of Medicis, in circular borders; pope Leo X., an octagon plate; Juſtus Lipſius, Iſcanus; and Claudius Maugis, abbé of St. Nicholas, from Ph. de Champagne, all of 4to. ſize; John de Serres, after N. Van der Horſt, in 4to.; Conſtantine Hughens, ſecretary to the prince of Orange; John Livins, del.; a buſt of the emperor Charles V. and the conſtable of Bourbon, both from Titian, in folio; another of the emperor Charles V., after a copy by Rubens, from Titian; Charles de Longueval, count of Buſquoi, after Rubens, a very fine and rare print, in large folio.

Hiſtorical, after various Painters.—“The Holy Family,” on a black ground (engraved in England), after Raphael; “The Entombing of Chriſt,” and “St. George on Horſeback,” both from the ſame painter, in folio; “Chriſt in the Garden of Olives,” after Caracci, in large folio; “The Virgin and Holy Infant,” worſhipped by two pilgrims, in folio, after Michael Angelo; “The Adoration of the Shepherds;” the ſame ſubject differently treated; “The Adoration of the Eaſtern Kings,” a very fine and rare print; a repetition of the ſame ſubject, all in large folio; “The Holy Family,” accompanied by St. Anne; another “Holy Family,” where the infant Chriſt careſſes his mother; “The Virgin and Holy Infant”, accompanied by St. John; “Cæſar's Tax, or the Tribute Money,” all in folio; “The Deſcent from the Croſs,” in large folio; (the beſt impreſſions of this plate are inſcribed C. Van Merlen); “The Angel appearing to the Holy Women at the Sepulchre of Chriſt,” in folio; “St. Francis receiving the Stigmatics;” “The Martyrdom of St. Lawrence,” both in large folio; “Mary Magdalen throwing away her Jewels;” the frontiſpiece of a book, intitled “A general Eccleſiaſtical Hiſtory, from the Birth of Jeſus Chriſt to the Year 1624,” in folio, all after Rubens. “The Flagellation of our Saviour,” in large folio, after G. Seghers; “The Death of St. Francis,” after the ſame painter; “St. Ignatius of Loyola;” “The Fable of the Satyr and his Gueſt, who blew hot and cold with the ſame Breath,” after Jac. Jordaens, in large folio; “The Chace of a Bear,” after Snyders; and “A Vocal Concert” of ſix perſons, among whom a girl is playing the guitar, after A. Colter, both of folio dimenſions.

Contemporary and compeering with the elder Vorſterman, were the Bolſwerts. The biography of theſe was inſerted in our fourth volume before our preſent arrangement in ſchools was determined on (ſee BOLSWERT, ADAM, or BOETIUS, and SHELTIUS); but of the works of artiſts ſo illuſtrious, it has been judged proper to add a more copious liſt for the information of collectors, omitting thoſe which are already before the reader in vol. iv. The monograms with which theſe artiſts ſeverally marked their performances, may be ſeen in our third plate of thoſe uſed by the engravers of the Low Countries.

Works of Boetius a Bolſwert.—The portraits of Adam Saſbout, with the motto “Omnia Vanitas;” a pair of ditto of John Bergman, (a celebrated Jeſuit,) kneeling before a ſkull; and St. Aloïſe Gonzaga, kneeling before a crucifix, both in folio; Guillaume Louis, comte de Naſſau, and (its companion) the corpſe of the ſame nobleman lying in ſtate, dated 1618, and after M. Mirevelt, in folio; a ſet of ſeventy-ſeven ſmall plates, from deſigns by Bolſwert himſelf, done to accompany “The Life of Chriſt;” another ſet of ſmall book plates, alſo from his own deſigns, engraved for a myſtical work, entitled “Le Pelerinage.”

Hiſtorical Subjects after various Maſters.—“The Adoration of the Shepherds,” after Abr. Bloemart; “A Repoſe during the Flight into Egypt;” both in large folio. A ſet of four landſcapes, and fourteen plates of animals, in 4to. both from the ſame maſter; “Jeſus at the Houſe of Martha and Mary,” a rich compoſition, after J. Goiemar, a very large plate, very much ſought after; “Death and Time, conquering Men and Animals,” in folio, after D. Vinckenbooms; “Adam and Eve in the terreſtrial Paradiſe,” ſurrounded with animals, a very fine engraving from the ſame painter. Theſe three prints are very rare, and much ſought after by collectors; and “The Judgment of Solomon,” a large folio plate, after Rubens.

The moſt eſteemed works of *Sheltius a Bolſwert*, omitting thoſe mentioned in the Cyclopædia, vol. iv. and beginning with his *landſcapes*, are as follow:—The landſcapes of Sheltius are indeed very ſurpriſing performances. When we conſider the pictureſque ruggedneſs of his rocks, and boles of trees, and the freedom and looſeneſs of his foliage, it ſeems ſcarcely credible that ſo high a degree of excellence in this department of the art ſhould have been attained by the uſe of the graver alone; yet in all his landſcapes not a line of etching appears. Nor is our wonder leſs excited when we contemplate the tones, rich or exquiſite as the various occaſions required, which Bolſwert has here produced, more perfectly vibrating with thoſe of the original pictures: we had almoſt ſaid than thoſe of any other landſcape-engraver whatever. But certainly, in this reſpect, no engraver has ſurpaſſed him.

A large landſcape, wherein is introduced a lion-hunt, with a cavalier overthrown and another coming to his reſcue. This is one of the fineſt engravings of the whole ſet. A grand mountainous ſubject, with romantic falls of water, into which is introduced the effect of a ſtorm, and the fable of the hoſpitality of Philemon and Baucis towards Jupiter and Mercury. The companion to which is a ſea-ſtorm and ſhipwreck; the fore-ground is occupied by mariners who have eſcaped the wreck, and are kindling a fire on the ſhore. (This print is commonly called the "Tempeſt of Eneas.") A foreſt-ſcene, into which is introduced the fable of Meleager and Atalanta; the champaign of Malines, with haymakers; a large landſcape, with animals in a ſtable, and a female filling a pig's-trough with food. (This laſt, completing the ſet, is engraved by P. Clouet.) A landſcape with ruined edifices, and two women carrying baſkets in the fore-ground. Ruins on a plain, with various ruſtic figures. A landſcape, in the fore-ground of which is a wooden bridge, with a ſhepherd and flock. A champaign country, with two women in the fore-ground, one of whom carries a baſket, and the other a rake; a rainbow is repreſented in the clouds. Sun ſet, with a man bringing horſes to water, and a landſcape, with the effect of moon-light.

Devotional Subjects, &c. from his own Deſigns.—"The Infants Chriſt and St. John playing with a Lamb;" "The Virgin and Infant aſleep;" "The Virgin ſuckling the Holy Infant;" "A Statue of the Virgin, with her Hands croſſed on her Boſom;" all in 12mo. "The Virgin and Child in the Air, attended by Angels and Cherubim;" "The Virgin careſſed by the Infant Chriſt, with St. Joſeph." Twelve figures of ſaints, half-length. Another ſet of twelve of ſaints, all in 8vo. "A Hermit proſtrate before a Croſs;" "The Mother of Grief, piercing her Boſom with a Sword;" "Jeſus Chriſt triumphing over Death;" both in folio. "St. Barbara, a Virgin-Martyr;" "St. Staniſlaus Koſka, kneeling before an Altar;" "St. Francis Borgia;" "St. Alphonſo Rodriguez;" "Robert Bellarmin, at a Bureau;" "Leonard Leſſius;" all in large folio. "The reſigned Death of a Saint," and "Dreadful Death of a Sinner," two folio prints. An emblematical ſubject, relating to prince Ferdinand, the governor of the Low Countries, in large folio. "A Theſis," dedicated to Sigiſmond, kind of Poland, on two large plates. The frontiſpiece, and five other plates for Thibault's Fencing Academy, in large folio, and a rare print, entitled "The Diſpute between the Fat and the Lean," in large folio.

Portraits after ſir Anthony Vandyke.—Sheltius a Bolſwert; Andrea Van Ertvelt; Martin Pepyn; Adrian Brouwer; and John Baptiſta Barté; (all diſtinguiſhed artiſts;) Juſtus Lips, an hiſtorian; Albert, prince of Aremberg, Barbanſon, &c.; Maria Ruten, the wife of Vandyke; Margaret of Lorrain, ducheſs of Orleans; William de Vos; and Sebaſtian Vrank; painters, all of folio dimenſions.

Hiſtorical Subjects after Vandyke.—"Maria Mater Die, or the Virgin in Extaſy," in folio; "The Virgin with the Infant Chriſt on her Knees, attended by St. John, and an Angel with a Crown," in large folio; "The Virgin contemplating the Infant Chriſt on her Lap, accompanied by a Saint holding a palm Branch;" "The Virgin ſeated, with the holy Infant aſleep in her Arms, with St. Joſeph," both of folio ſize; another "Holy Family, attended by Angels;" "The Elevation of the Croſs on Mount Calvary;" "Chriſt on the Croſs," at the foot of which are St. Dominic and St. Catherine of Sienna, both in large folio; and "A Drunken Silenus, attended by Bacchanals and Satyrs," in folio.

Hiſtorical, after various Maſters.—"Chriſt on the Croſs," with St. John and the holy women at the foot, after Jordaëns; "Argus lulled to ſleep," with Mercury preparing to behead him; "The Infant Jupiter," with a nymph milking the goat Amalthea, accompanied by a ſatyr playing the tambourine, both in large folio. The two latter are the fineſt of Bolſwert's engravings after Jac. Jordaëns. A family concert, inſcribed "Soo D'Oude ſongen, Soo pipen de Jongen." "Pan holding a Baſket of Fruit, accompanied by Ceres crowned with Wheat, and a Figure blowing the Horn," both in folio, and from Jordaëns. Impreſſions of the latter are become very rare; "The holy Salutation," after Gerard Seghers. "The Return from Egypt," where the Infant Chriſt appears walking between St. Joſeph and the Virgin; "The Virgin appearing to St. Ignatius of Loyola;" "St. Francis Xavier tempted by Satan, and comforted by the Apparition of the Virgin and Child;" "The Denial of St. Peter," in an aſſemblage of ſoldiers, playing at cards; and its companion, "The Smokers," two very capital prints in large folio, after G. Seghers; "A Concert," after Theodore Rombout, being the companion to one of the ſame ſubject engraved by Vorſterman, after Coſter; "The Virgin and holy Infant," (who holds the globe of the earth,) after Eraſmus Quelinus; "The Communion of St. Roſe," after the ſame painter; "The Body of Chriſt on the Lap of the Virgin," after Diepenbeck; and "The Crucifixion of three Jeſuits at Japan," after the ſame painter, all of large folio dimenſions.

Hiſtorical, &c. after Rubens.—"The Annunciation," the beſt impreſſions of which are marked with the name of Vanden Enden; "The Return from Egypt;" "The Executioner giving the Head of St. John the Baptiſt to Herodias," in folio; "Chriſt crucified between the two Thieves," in folio; "A Crucifixion," wherein a ſoldier is piercing the ſide of Chriſt; St. John and the Virgin are ſtanding at the foot of the croſs; a very beautiful engraving, executed in a bold ſtyle, in large folio; "A Crucifixion," with the city of Jeruſalem in the back-ground; and another engraving of the ſame ſubject, both in large folio; "The Body of Chriſt on the Lap of the Virgin, with St. Francis," in large folio; "The Reſurrection," and "The Aſcenſion of Chriſt," two large folio plates; "The Trinity," where Chriſt is repreſented dead, a fore-ſhortened figure ſupported by the Deity; "The four Evangeliſts," in large folio; "The Triumph of the Church," a large folio plate nearly ſquare; "The Deſtruction of Idolatry," a large print lengthways, on two plates; "The Fathers of the Church, ſurrounding St. Clare, with the Sacraments," a large folio plate nearly ſquare; "The immaculate Conception of the Virgin," a circular print in large folio; another "Aſſumption of the Virgin," where a diſciple raiſes a ſtone at the mouth of the ſepulchre; "The Virgin embraced by the Infant Chriſt," "The Infant Chriſt on a Table careſſing his Mother;" "The Virgin, with the holy Infant on her Lap, holding a Globe and Sceptre;" "The Holy Family," where the infants Chriſt and John are playing with a lamb; and four other engravings of the ſame ſubject, in large folio; "St. Franeis Xavier ſtanding before a Crucifix," in folio; and its companion "St. Ignatius of Loyola," before the name of Jeſus, ſurrounded with rays of glory; "St. Cecilia playing on the Organ," a diſtinguiſhed plate, the firſt impreſſions of which are inſcribed G. Hendrix. Thoſe where the name of Witdoeck is ſubſtituted for that of Bolſwert are retouched, and of very inferior value. "St. Thereſa interceding at the Feet of Chriſt, for the Souls in Purgatory," in large folio. Nymphs and ſatyrs laden with fruit and game, half figures, commonly called "The Return from the Chace," in folio. "A drunken Silenus," ſupported by a ſatyr, and another figure. The impreſſions, with the name of Bolſwert only, without the addreſs, are the earlieſt and beſt. "The Continence of Scipio," in large folio. Thoſe impreſſions are the beſt with the name of Hendrix. "A triumphal Arch," in honour of Ferdinand, cardinal-infanta of Spain, and governor of the Low Countries, in large folio, and "Jeſus Chriſt, the two Virgins, four Angels, and many other holy Perſons," engraved by S. a Bolſwert and Corn. Galle, and inſcribed with the name of Hendrix, in folio.

Paul de Pont, or Pontius, the third of our celebrated chalcographic triumvirate of the Netherlands, was born at Antwerp A. D. 1596, and became the diſciple of the elder Vorſterman, both maſter and pupil being at the time befriended and improved by the frequent counſel and advice of Rubens. The beſt works of Pontius, and which form the baſis of his well founded celebrity, are free graphic tranſlations from the originals of that great maſter, in the accompliſhment of which he united preciſion of touch, with a nice perception of form, character, and expreſſion. His manual power and command of the graver was ſcarcely inferior to that of his contemporary Bolſwert, and if in taſte he was inferior to Vorſterman; in a juſt and even penetrating obſervation of the peculiar merits of the picture before him, and the principles upon which thoſe excellencies were produced and connected, he was inferior to neither. Care, obſervation, feeling, were pre-eminently his; and hence the truth and vigour of his hiſtorical heads. Genius, and profound knowledge of the human figure, certainly belonged in higher degrees of perfection to Vorſterman and the Bolſwerts.

In commenting on the productions of this illuſtrious triumvirate, a foreign critic of eminence dwells with juſt emphaſis on the neglect and the importance of aſcertaining what ought to be eſteemed *principle* in engraving, as well as in all other arts that are with propriety ſo termed; and when we call to mind, and apply the well-founded aphoriſm of Hippocrates, that "art is long, life ſhort, opportunity fleeting, and even experiment, ſometimes fallacious," it may well ſeem extraordinary that among the critics and connoiſſeurs of the Low Countries, nothing was done towards aſcertaining and publicly explaining the merits of theſe admirable engravers, and that in any part of Europe, ſo little has been done in this art toward aſcertaining principle at all. The art of the ſtatuary, and the ſiſter art of painting, have been cultivated, and have flouriſhed under the mild and cheering influence of ſettled laws; their actual progreſs, as well as occaſional retrogradations, are known and underſtood: while engraving has been doomed to the undetected endurance of the wildeſt anarchy; of licentious and contradictory practice; and merit, demerit, and mediocrity, have alike had their hour of idle gazing, and have alike fleeted from that ſteady critical comment which ſhould have marked the ſtages of the progreſs of the art.

Some writers have idly aſſerted that Rubens occaſionally worked on the plates of theſe artiſts. The fact is, (as we have reported in our ſhort notice of the etchings of this maſter), that Rubens had ſo little pretenſions of this kind, indeed was ſo far from poſſeſſing any power over the graver, that the few touches that were wanting after corroſion, to the completion of his plates, were ſupplied by his friends Vorſterman, Bolſwert, or Pontius. The error has originated from its having been the cuſtom of theſe artiſts, for Rubens to reviſe and touch from time to time upon trial-proofs that were taken to aſcertain the engraver's progreſs: in doing which, as theſe engravers worked after Rubens and Vandyke, with the freedom and fellow-feeling of friends, not with the ſervility of ſlaves, it was ſometimes found neceſſary to vary the chiaroſcuro from the original pictures, in order that when the local colours were abſtracted, the ſpectator's perceptive faculties ſhould be impreſſed or operated upon, in a ſimilar manner, and conſequently his mind affected in the ſame way, as by the combinations of colour with light and ſhade in the original pictures: for, paradoxical though it may appear, it is clear that theſe men of genius thought and felt thus upon the ſubject, nor is it leſs clear to thoſe who ſtudiouſly compare the engravings of theſe maſters with Rubens' original pictures, that they were right in ſo thinking.

The following engravings, from the hand of P. Pontius, are deſervedly held in conſiderable eſtimation.

Portraits after Vandyke.—Paul Pontius, engraved by himſelf; ſir Peter Paul Rubens; James de Breuck, architect; John Wildens; John vans Raveſtein; Palamede Palamedeſſen; Theodore Vanloo; Theodore Rombouts; Gerard Honthorſt; Henry van Balen; Adrian Stalbent; Gerard Segher; Simon de Vos; Daniel Mytens; Gaſpar de Crayes; and Martin Pepyn; all celebrated artiſts of Antwerp. Gaſpar Gevartius, juris-conſulte; and Nicholas Rockok, magiſtrate of Antwerp; John van den Wouwer, counſellor to the king of Spain; Cæſar Alexander Scaglia, abbé of Staphard; Guſtavus Adolphus, king of Sweden; Mary of Medicis, queen of France; Emanuel Frocas Perera, count of Feria; Francis Thomas, of Savoy, prince of Carignano; John, count of Naſſau, general to the king of Spain; Don Alvarez, marquis of Santa Cruz, and governor of the Low Countries; Don Carlos, of Colonna, (a Spaniſh general;) Don Diego Philip de Guſman, marquis of Leganez, and Spaniſh general; Mary, princeſs d'Aremberg; Henry, count de Berghe; Cornelius van den Geeſt; and Balthaſar Gerbier, miniſter from the court of Spain to that of England, all of folio dimenſions; Frederic Henry, prince of Orange; and Francis Thomas of Savoy, prince of Carignano, both in large folio.

Portraits after Rubens.—Sir Peter Paul Rubens; Gaſpar Gevaerto, juris-conſulte; Ladiſlaus Sigiſmond, prince of Poland and Sweden, all in folio; Philip IV. king of Spain; and its companion, Elizabeth of Bourbon, his queen, (the beſt impreſſions of theſe portraits are before the name of G. Hendrix, was inſerted;) Elizabeth Clara Eugenia, infanta of Spain; Ferdinand, cardinal, infanta of Spain, and governor of the Low Countries; Gaſpar Guſman, duke of Olivares, a very fine portrait, done from a copy by Rubens, of a picture of Velaſquez, all in large folio; and a ſet of three, in folio, very fine and rare portraits, of Chriſtoval, marquis of Caſtel-Rodrigo; Manuel de Moura Cortereal, marquis of the ſame place; and a Spaniſh lady, adorned with a necklace of precious ſtones; the mother of Manuel of Caſtel-Rodrigo.

Portraits from various other Painters.—Raphael d'Urbino, in the coſtume of his age; Ambroſius, count of Hornes, after F. de Nys; Abel Servien, count de la Roche des Aubins, and miniſter plenipotentiary to the court of Munſter, after Anſ. van Hulle; and John de Heem, a painter of Utrecht, after John Lyvins, all of folio dimenſions.

Hiſtorical Subjects, after Rubens.—"Suſanna ſurpriſed by the Elders;" "The Adoration of the Shepherds," (a circular plate,) both in large folio; "The Slaughter of the Innocents,"

Innocents,” a very large print, lengthways, on two plates; “The Preſentation in the Temple,” a fine plate; “Chriſt bearing his Croſs;” an allegorical piece, known by the appellation of “The Chriſt of the Clenched Fiſt,” becauſe one of the angels who are overthrowing Sin and Death has his fiſt clenched, a very fine engraving; “The Madre Doloroſa, or Dead Body of Chriſt on the Lap of the Holy Virgin,” and “The Deſcent of the Holy Ghoſt, or Miracle of the Cloven Tongues,” all of large folio ſize; “The Holy Spirit ſubduing the Fleſh,” (an allegorical ſubject,) a very rare print, in folio: a large folio print, called “Rubens's Epitaph,” from a picture in the church of St. James, at Antwerp. The ſubject is a religious allegory, in which Rubens himſelf appears in the character of St. George. A head of Chriſt, in an oval, of folio ſize; “The Aſſumption,” in large folio; “The Coronation of the Virgin,” one of the latter engravings of Pontius, in folio; “The Virgin ſuckling the Infant Jeſus,” a rare print, in octavo; “The Holy Family,” where the Infant Jeſus is careſſing his mother, half-length figures; “Chriſt appearing to St. Roch,” with “Eris in peſte Patronus” inſcribed on a banner, a fine print, and engraved from a picture which is eſteemed among the very fineſt of the works of Rubens; a very large and rare engraving, in which real and allegorical perſonages are oddly aſſociated, à la Rubens, for the ſake of complimenting the princes of the houſe of Auſtria and the Cordeliers; and a very large upright print, of “The Diſpute between Neptune and Minerva,” dedicated to pope Urban VIII.

Hiſtorical, &c. after various Painters.—“The Flight into Egypt,” after Jac. Jordaens, (the beſt impreſſions of the engraving are before the name of Bloteling was inſerted;) “The Feſtival of the Kings” after the ſame painter, a fine engraving; “The Adoration of the Kings,” after Gerard Seghers, all in large folio; “The Virgin and Holy Infant, accompanied by St. Anne,” in folio; “St. Francis Xavier, proſtrate before the Virgin and Child,” a circular print; “St. Sebaſtian, and an Angel drawing an Arrow from his Side,” all from G. Seghers; “The Dead Body of Our Saviour on the Lap of the Virgin,” or, “Madre Doloroſa,” after Vandyke, all in large folio; “St. Hermanus Joſeph,” from a picture painted for the Jeſuits of Antwerp, and now in the royal gallery at Vienna; “St. Roſalia, receiving a Crown from the Infant Jeſus,” both from the ſame painter, in folio; “The Holy Family,” after John van Hack; and “The Entombing of Chriſt,” after Titian, in large folio.

Of merit very inferior to that of his father, was Lucas Vorſterman the younger: he was born at Antwerp in the year 1600, and learned the elements of engraving under his paternal roof. He alſo practiſed the art of drawing portraits from the life. But though he ſcarcely reached above mediocrity in either art, his productions, of which the following are thoſe moſt worthy of eſteem, are ſought after by the curious.

Lucas Vorſterman, the father, from Ant. Vandyke, in folio; “The Virgin Mary,” ſhe is repreſented in the clouds, and ſurrounded by angels; “Chriſt crowned with Thorns, and mocked by the Jews,” both in quarto, after Vandyke; “The Trinity,” after Rubens, in folio; the fable of “The Satyr and his Gueſt, who blew hot and cold,” in large folio, nearly ſquare, after Jacques Jordaens; part of the plates for the large folio “Treatiſe on Horſemanſhip,” by the duke of Newcaſtle; ſeveral of the plates from the gallery of the archduke Leopold, at Bruſſels, which were publiſhed by David Teniers, the younger: and part of the collection of drawings of Nicholas Lanier, a muſician and amateur of the reign of Charles I. This latter ſet is, perhaps, the beſt part of the works of the younger Vorſterman.

Peter Soutman was born at Haerlem in the year 1580; or not long afterward, and became the diſciple of Rubens. Beſide etching and engraving, he painted both hiſtory and portraits with ſucceſs, and was patronized, not only in Flanders, but alſo in Germany and Poland.

We have a great number of prints by this artiſt, both from his own compoſitions and thoſe of other painters, particularly his great maſter, Rubens. They are for the moſt part etched, and with great ſpirit, not all in the ſame ſtyle, but under the influence of the different notions and feelings which from time to time appeared to have prevailed, as he endeavoured to explore the capabilities of a new art, in which the practice of his predeceſſors and contemporaries ſhewed him that there remained much to diſcover. He is like an early voyager, who ſometimes warily coaſts the lands which others have touched at before him, and ſometimes with better hopes and bolder navigation puſhes forth into unknown regions, obſcurely guided by the dubious bearings of the headlands which he fancies he has deſcried. Watelet ſays his ſtyle is, in ſome inſtances, contrary to the theory of the art, though as no ſyſtem of principle was then ſettled, or is even yet aſcertained, he can only mean that in thoſe inſtances it is oppoſite to the practice of certain engravers, whoſe works had obtained the praiſe of ſuch reputable and eſtabliſhed connoiſſeurs as Watelet himſelf. He continues, “but his prints always convey an idea of the ſoftneſs of fleſh, and the colouring of the pictures from which they are taken. He engraved in a pure ſtyle, with the ſame merits and faults as I have remarked in his etchings.” And Strutt, with perhaps a perception ſomewhat clearer of Soutman's intentions, informs his readers that “Soutman ſeems to have aimed at giving a ſtriking effect, by keeping all the maſſes of light broad and clear; but by carrying this idea too far, almoſt all his prints have a ſlight unfiniſhed appearance, though the engraving is, in itſelf, ſufficiently neat. There is the ſtyle (of drawing) of the maſter in the treatment of the heads and other extremities of his figures,” &c. &c.

For the ſake of not diſconnecting thoſe artiſts who moſt diſtinguiſhed themſelves by their attainment of that particular merit which moſt ſtrongly characteriſes the ſchool of the Netherlands, and who ſhould therefore be contemplated together, we have placed Soutman a little behind his chronological rank; but it ſhould be recollected to his credit, that Vorſterman was his fellow pupil, and that, in all probability, the enterpriſing prow of our artiſt, and the beacons he ſet up, at once ſtimulated and taught Pontius and the Bolſwerts when and where to launch forth, and how to traverſe, with leaſt danger, the unfathomed ocean of their art.

Of the engravings of Soutman, it may be ſufficient, in this place, to mention the following.

Portraits.—Joannes Wolferdus de Brederod, gener. Marſchalcus Belgii confederati; Gerard von Honthorſt pinx; the armouries of Orange Naſſau, ſurrounded with trophies and allegorical figures; the frontiſpiece to the portraits of the counts of Flanders; Soutman pinx. et ſculp.; the emperor Adolphus of Naſſau; the empreſs of Ferdinand II., queen of Hungary and Bohemia, both from Van Sompel; John the Intrepid, count of Flanders; and Philip IV. king of Spain and the Indies, all in large folio.

Hiſtorical, &c.—“The Fall of the Damned,” a large upright, after Rubens, the early impreſſions of which are known from thoſe ſubſequently printed, by their having been taken before the addreſs of the junior Bouttats was inſcribed beneath the plate; "The Defeat of the Army of Sennacherib by the exterminating Angel," alſo after Rubens, and in large folio; "Jeſus giving the Keys to St. Peter," from Raphael; "The miraculous Draught of Fiſhes," from Rubens, all in large folio; "The Laſt Supper," a very long print, engraved on two plates, from the celebrated picture of Da Vinci, in the refectory of the Dominicans at Milan, engraved through the medium of a drawing by Rubens; "Chriſt on the Croſs," after Rubens, of which plate it is very uncommon to find a good impreſſion; "Chriſt laid in the Sepulchre." The firſt impreſſions of this plate being very faint, Widoeck worked afterwards on the plate, to give it more effect. "The Creation of a Biſhop," all in folio; "The Rape of Proſerpine;" "The Triumph of Venus," in large folio; and "A drunken Silenus," ſupported by a ſatyr and a negreſs, all after Rubens; "The Grand Sultan on Horſeback," attended by his principal officers at the head of his army, in folio, from a picture by Soutman himſelf; a ſet of four large hunting pieces, namely, the chace of a lion and lioneſs, ditto of a wolf, ditto of a boar, and ditto of a crocodile and hippopotamus, engraved on two plates, all after Rubens; "A couchant Venus," after Titian; and "St. Francis kneeling before a Crucifix," from Michael Angelo, both of folio ſize.

Sneyders was flouriſhing at this period, and contributed to the advancement of engraving by a book of animals, which he etched with a degree of truth and animation correſponding with what we behold with ſo much pleaſure in his pictures. His etchings conſiſt, we believe, of ſixteen plates, which are not all of the ſame dimenſions. For the biography of this extraordinary artiſt, ſee the article SNEYDERS, FRANCIS.

John Vrediſnan Friſius was born at Leuwarde in the year 1527. He was an architect of ſome talent, as well as an engraver; and is the deſigner of the arch erected at Antwerp, in honour of the triumphal entry of Charles V. and his ſon. The principal engravings of the elder Friſius are contained in a book of ſepulchral monuments, which are preſumptively from his own deſigns. The work was publiſhed at Antwerp, A.D. 1563. His ſtyle conſiſts of a coarſe and heavy mixture of etching, with the work of the graver.

Related to the above artiſt were John Eillart Friſius and Simon Friſius: the former is the author of ſome few portraits, among which are thoſe of Henry IV. of France, and Henry of Naſſau, prince of Orange; both of which are folio dimenſions.

But Simon Friſius was an artiſt of abilities very ſuperior to thoſe of his relatives. He was born at Leuwarde in Frieſland, A.D. 1580, and learned the rudiments of engraving of Eillart, or of Vrediſnan. He handled the etching-needle with great taſte and facility; and his etchings are now become rare, and are much ſought after. Abram Boſſe ſays, "Simon Friſius handled the point with great freedom, and his hatchings poſſeſs the firmneſs and neatneſs of engraving." He adds, (what we do not very well underſtand,) that "this artiſt made uſe of a ſoft kind of varniſh, ſuch as is uſed by refiners in the ſeparation of metals."

He ſometimes ſubſcribed his plates with "F. fecit;" and at others, with his initials "S. F.:" and his beſt prints are a ſet of heads of the ſybils and ſaints, in 4to., from his own deſigns; a ſet of portraits, after H. Hondius, in ſmall folio; a large collection of folio landſcapes, after Matthew Brill, entitled "Topographia variorum Regionum;" two landſcapes, from Henry Goltzius, of which the ſubject of one (of 4to. ſize) is a cottage and figures on the ſea-ſhore, the other is an architectural landſcape in folio, with figures, in the introduction and execution of which Friſius was particularly excellent; another landſcape, in which is introduced the ſtory of Tobit and the angel, after P. Laſtmann; another, with the flight into Egypt; and a very rare landſcape, delicately engraven, wherein are buildings and ruſtic figures, in large folio.

James Fouguieres and Jodocus de Momper, or Mompert, were both born at Antwerp in the year 1580. For an account of their merits as landſcape painters, ſee their names reſpectively. Both occaſionally practiſed with ſucceſs the art of etching; working from their own compoſitions. Fouguieres' etchings are not numerous, and conſiſt of ſmall landſcapes: Mompert's are ſomewhat larger, and one in particular, which is now become rare, is a large folio landſcape, a rocky ſcene, and etched in a very bold ſtyle, quite in the extreme of boldneſs.

Adrian Stalbent was alſo of Antwerp, and contemporary with Fouguieres and Mompert. He reſided for ſome years in England, from whence he returned rich; though it may reaſonably be ſuſpected whether, at this period, his riches could have been obtained in this country by painting and etching landſcapes. He, however, continued to paint and etch in the city of Antwerp, until he attained to upwards of fourſcore years of age.

Of his etchings, the beſt with which we are acquainted is a folio landſcape of the ruins of a magnificent Engliſh abbey, with ſheep on the fore-ground: it is inſcribed "Adrianus van Stalbent fecit in aqua forti."

James William Delff was the ſon of William James, of whom we have ſpoken in our account of the *Origin and Progreſs of* ENGLISH *Engraving*. He was born in the year 1619, at Delft, and died in the ſame city in 1661. He learned the elements of painting and engraving of his father, whoſe ſtyle he always copied, and which, with the ſimilarity of their names, has occaſioned their works to be often confounded. He engraved a ſet of portraits in ovals, of folio ſize, of which the following are the moſt remarkable: Charles I. of England; queen Elizabeth; Ferdinand II. emperor of Germany; Frederick, palatine, king of Bohemia; Frederick Henry, prince of Orange, count of Naſſau Katzenellenbogen; Guſtavus Adolphus, king of Sweden; James, king of England; Louis XIII. of France; Axel Oxenſtiern, a Swediſh miniſter; Philip III. of Spain; Philip IV. of Spain; Ambroſius Spinola; and Vladiſlas IV. king of Poland.

John Savary, or Savery, was born at Courtray in the year 1580. He ſtudied engraving under Hans Bol, reſided during moſt part of his life at Amſterdam, and was related to John and Roland Savery, who were both painters, and to Solomon Savery the engraver, of whom we ſhall next proceed to ſpeak.

The following engravings are all we can ſpecify by the hand of this artiſt, who was alſo a landſcape painter: a ſet of ſix mountainous landſcapes, with figures, in 4to., after Nic. de Clerc; a ſtag hunt, with a landſcape back-ground, in folio; the ſtory of Sampſon killing the lion, introduced in a landſcape, in large folio; and a woody ſcene, with a waterfall, in folio.

Solomon Savery is believed to have been a native of Amſterdam: the time of his birth we have not aſcertained; but as his engravings were produced from the year 1620 to 164[illegible], he was perhaps the ſon and pupil of John Savery, whom we have juſt diſmiſſed. He is ſuppoſed to have paſſed ſome years of his life in England; a ſuppoſition which appears to be confirmed by the circumſtance of his principal works being portraits of the public characters of this country. But be this as it may, his merits were very conſiderable. He handled his graver with taſte, and a degree of ſkill which had not then been exceeded; and expreſſed the textures of the various objects, which he repreſented, with nice diſcrimination; of which his portrait of John Speed the hiſtorian, among ſeveral others, affords a pleaſing and ſatisfactory proof. His portraits are probably his beſt performances, though his hiſtorical ſubjects are not without a conſiderable ſhare of merit.

Among theſe may be diſtinguiſhed king Charles I., wherein Savery appears to have engraved the face from a picture by Vandyke, and to have added the high-crowned hat, and compoſed the other accompaniments; Thomas, lord Fairfax, and Speed the chronicler, of which we have ſpoken above, have alſo their heads covered with hats, to which circumſtance our engraver appears to have been partial, as giving effect to the faces of his portraits, and affording ſcope for the exerciſe of his manual power over his graver.

His beſt hiſtorical works are, “ Chriſt expelling the Money-changers, &c. from the Temple,” in large folio, from Rembrandt; ſeventeen plates for Ovid's Metamorphoſes; and a ſeries of ſmall plates of frieze proportions, of “ The Entry of Mary de Medicis into Amſterdam.”

James de Bie, or de Bye, was born at Antwerp in the year 1581, and not only diſtinguiſhed himſelf as en engraver, but alſo as a draftſman and an antiquary. He ſtudied engraving in the ſchool of the Collaerts, and ſucceſsfully imitated their ſtyle; finiſhing his plates entirely with the graver in a neat, clear, and determined manner.

De Bye drew correctly. The heads of his figures poſſeſs conſiderable accuracy of character and expreſſion, and their hands and feet are well marked; but from his lights being ſo much ſcattered, and his ſhadows ſomewhat feeble, his chiaroſcuro is by no means powerful. His prints, however, may rank with thoſe of the beſt early Flemiſh maſters. He, with his contemporary Battiſta Barbe, aſſiſted the Collaerts in engraving “ The Life and Paſſion of Chriſt,” from Martin de Vos. The work conſiſts of fifty plates, of which N° 18, (“ The healing of Peter's Mother-in-Law,”) and N° 30, (“ The Reſurrection of Lazarus,”) are fine ſpecimens of the abilities of de Bye, eſpecially the latter.

He alſo engraved the medals of the Roman emperors, from the cabinet of the duke d'Arſchot, which were originally publiſhed in the year 1617, and of which an edition was reprinted at Berlin in 1705; a medallic hiſtory of the kings, queens, and dauphins of France; another ſet of the portraits of the kings of France, from Clovis to Louis XIII., conſiſting of ſixty-four plates, of which fifty-eight are portraits; the genealogy and portraits of the houſe of Croix, on ſixty folio plates; the portrait of Francis I. of France, in folio, after M. de Vos; and a ſet of metaphyſical perſonifications from his own deſigns, publiſhed at Paris in 1643, with explanations by J. Baudouin.

Mark and Nicholas de Bye were of the ſame family with our artiſt, but are not worthy of much notice as engravers. Mark performed ſome etchings, after P. Potter and M. Gerard; and Nicholas engraved portraits, among the beſt of which is Charles IX. king of France.

Peter Laſtman was born at Haerlem in the year 1581. He was an hiſtorical painter of merit, and is reported to have been one of the inſtructors of Rembrandt. Laſtman etched ſeveral plates after his own compoſitions, in a very good taſte, which are at preſent very rare: of theſe we can only ſpecify two, the ſubjects of which are “ Judah and Tamar,” introduced into a landſcape, in ſmall folio; and a female veiled, reclining in a bower, in 4to.

Nicholas Laſtman was the ſon of Peter, and born at Haerlem in 1619. He was inſtructed in the elements of painting, and the general rudiments of art, by John Pinas; and it is probable he learned engraving from Saenredam. Among other things, he engraved the portrait of Carl von Mander,” after Saenredam, in 4to.; “ Our Saviour in the Garden of Olives,” after his father, in large folio; “ St. Peter delivered from Priſon by the Angel,” after J. Pinas; and its companion, “ The Martyrdom of St. Peter,” both in ſmall folio; “ The Good Samaritan,” from a picture by himſelf, is probably his chef-d'œuvre. The ſtory is introduced in a very pictureſque landſcape, towards the right ſide of which appears a ſtone-bridge over a river, along which the uncharitable prieſt and Levite are walking. “ This print is very little known, though it deſerves great attention from the taſte and beauty of the execution.” So ſays Huber: but what we have not witneſſed, we cannot confirm; and what we have ſeen from the graver of Laſtman, though neat, are taſteleſs productions.

For the biography and extraordinary merits, as painters, of the two Teniers, ſee the articles TENIERS, DAVID, the elder, and the younger. They each produced ſeveral etchings from their own compoſitions, which go to ſhew that very great painters may poſſibly make but indifferent engravers. By this is not meant that their etchings are devoid of fire and freedom; but that they fall ſhort of what might naturally be expected from the high reputation which is juſtly attached to the name of Teniers, and particularly in that paſtoral elegance of touch and handling, which confers poetic charms on their *painted* village feſtivities, in ſpite of the caprices of faſhion, and the royal French taſte of Louis XIV., who, when an admirable picture of the younger Teniers was placed before him, is reported to have turned round and ſaid to his firſt valet-de-chambre, “ Qu'on m'ôte ces magots!” which of courſe was echoed in the applauſes of the whole French court.

The etchings of the Teniers find, however, a very proper and indeed indiſpenſable place in the port-folios of thoſe connoiſſeurs, who collect the productions in fine art of the Netherlands. As both the father and ſon marked their prints with the ſame cypher, which will be found in *Plate* III. of the monograms, &c. uſed by the engravers of the Low Countries, it is not eaſy to diſtinguiſh them; but the following are generally aſcribed to Teniers the elder: “ A Pilgrim, with his Staff and Chaplet,” in 12mo.; “ A Peaſant ſeated, applying a Plaſter to his Hand;” “ A Peaſant ſeated at Table, with a Crutch and Glaſs;” another peaſant with a fur hat on; and one with a pipe; “ An old Woman, with a Chaplet; and “ An old Man and Dog;” “ A Man with a Staff;” a ſet of four, of peaſants, half-length; “ A German Kitchen;” another ſet of peaſants, ſmoking and playing at bowls, all of octavo ſize; and a quarto print, called “ The Bowl Players.”

And to the junior Teniers are aſcribed, “ A Peaſant ſmoking,” he is ſeated on a cheſt, and in company with another; a landſcape, with cottages and peaſants converſing; another landſcape, with four peaſants converſing; “ Villagers ſeated round a Fire, inſide a Cabin,” with the effect of moon-light, all in 8vo.; two prints of peaſants travelling; “ Peaſants ſhooting at a Mark;” “ The Temptation of St. Antony;” “ A Flemiſh Feſtival;” “ A Village Entertainment;” three heads, apparently portraits, namely, an old man with an hour-glaſs, an old man playing on a flute, and a lady holding a flower, ſmall upright plates; “ The Inſide of a Cottage,” with a dead calf hanging up, and a man and a woman ſtanding by the ſide of it, a ſmall plate lengthways.

John Baptiſta Barbé was born at Antwerp in the year 1585. He ſtudied engraving in the ſchool of the Weirixes, and after attaining a competent maſtery of the graver, and ſucceſsfully imitating the dry and elaborate neatneſs of his inſtructors, he travelled to Italy for improvement.

No artiſt of that day, with genuine profeſſional objects in view, could travel to Italy altogether in vain. Barbé made conſiderable improvement in his knowledge and taſte of forms, but was not able to emancipate himſelf from the ſhackles of his earlier education.

Accordingly we find that in his latter engravings, though his figures are drawn with tolerable correctneſs, and his extremities well marked, his chiaroſcuro is flat and powerleſs, and his manual execution painfully neat, dry, and inſipid He worked with the graver only; ſometimes deſigning and inventing his own ſubjects; and at others, working after the originals of other maſters.

Of the former kind are “The Annunciation,” inſcribed “Spiritus Sanctus;” “The Nativity,” inſcribed “Peperit Filium;” “The Arrival of the holy Virgin and St. Joſeph at Bethlehem;” “The holy Virgin and Child,” ſurrounded by a garland of flowers, and inſcribed “Beatus Venter,” &c.; “Jeſus Chriſt on the Mount of Olives;” “Our Saviour with the Diſciples at Emmaus;” “The Crucifixion,” inſcribed “Protie Fili mi,” &c.; “St. Ignatius kneeling before an Altar;” and a ſet of four emblematical ſubjects, entitled “The Chriſtian Virtues,” all of ſmall dimenſions.

After various other Maſters.—Barbé engraved “The Holy Virgin ſitting at the Foot of an ancient Monument, with the Infant Chriſt and Joſeph,” in ſmall folio, after J. B. Paggi, (one of his beſt prints); another “Holy Family,” in 4to. after Rubens, alſo in the improved ſtyle of our engraver, and certainly a meritorious work; the proof impreſſions of which (taken before the name of Rubens was inſcribed on the plate), are rare, and bear a high price. A ſet of twenty-four in 12mo. of the Life and Miracles of Father Gabriel Maria, founder of the Annonciades, after Ab. van Diepenbeck; and “The Holy Virgin ſeated on a throne with the Infant Chriſt,” after Franciſco Frank, in ſmall folio, and eſteemed one of the maſterpieces of our artiſt.

William van Nieulant was born at Antwerp in the year 1585. He became the diſciple of Roland Savery, but after quitting his maſter he went to Rome, and reſided three years in that city with his countryman Paul Bril. He afterwards returned to the Low Countries, and took up his reſidence at Amſterdam, where his pictures were held in high eſtimation, and where he died in the year 1635.

Nieulant etched ſeveral plates of landſcapes, both from his own deſigns and thoſe of Paul Bril. They are executed in a ſlight free ſtyle, and often worked upon afterward with the graver, to harmoniſe the lights, and ſtrengthen the maſſes of ſhadow.

Among the etchings of this artiſt, the following are held in moſt eſteem, *viz.* a ſet of ſixty, of views in Italy, ornamented with figures. Two landſcapes with ruins, into one of which is introduced the ſtory of the good Samaritan, and in the other Tobit and the angel, both in folio, from P. Bril. Two marine ſubjects, one with ſhepherds on the ſea-ſhore, and the other with veſſels, and a fortreſs on a rock, from the ſame painter; “The Ruins of the Temple of Juno, in the Capitol;” “The Ruins of the Temple of Venus;” “A View of the Triumphal Arch of Septimus Severus,” all in folio; and the three bridges acroſs the Tiber, with views of the city of Rome, engraved on three large plates, from his own drawings.

William ſhould not be confounded with Adrian van Nieulant, a landſcape painter of ſome eminence, who was likewiſe a native of Antwerp, and who died at Amſterdam in the year 1601.

Peter Holſtein was born at Haerlem in the year 1582, and reſided in Holland at the commencement of the ſeventeenth century. He occaſionally practiſed the art of painting on glaſs; but was chiefly an engraver of portraits, among the chief of which are a ſet of twenty-ſix of the plenipotentiary miniſters of Munſter; John Saenredam, and Jacob vander Burchius, both in ovals; Fabius Chiſi, a negotiator for peace from Weſtphalia, afterwards pope Alexander VII.; John Erneſt Pictoris, a counſellor of the elector of Saxony; all of 4to. ſize; John Huydecooper, burgomaſter of the city of Amſterdam; John Reyner, hiſtoriographer for Munſter; Conſtantius Sohier; and Albert Vinkenbrink, a ſculptor of Amſterdam; all in folio.

Cornelius Holſtein was likewiſe born at Haerlem in the year 1620, and was the ſon of the preceding artiſt, of whom he learned the elements of art. He painted hiſtory with a moderate degree of ſucceſs. He likewiſe engraved ſome ſubjects from his own deſigns, and ſeveral of the plates for the cabinet of Gerard Reyniſt, a magiſtrate and connoiſſeur of Amſterdam. Yet of his engravings we are able to name only the following: a bacchanalian ſubject, of children at play, forming a long frieze, engraved on ſix plates, a very rare print; and a female ſeated, ornamented with jewels, ſuppoſed to be the portrait of Iſabella, marchioneſs of Mantua, from a picture by Correggio, or Julio Romano; engraved on a large folio plate for the cabinet of Reyniſt.

Peter van der Borcht was born at Bruſſels in the year 1540. The period of his life has not been recorded, but he appears to have reſided in his native city, except, perhaps, occaſionally in that of Antwerp, till ſome years after the commencement of the ſucceeding century.

He acquired ſome reputation in landſcape painting, but applied himſelf to etching with ſtill greater aſſiduity, and produced a conſiderable number of prints, moſt of which may be properly termed hiſtorical landſcapes. They are etched with little care, in a rough and licentious kind of ſtyle, and the figures which are introduced are by no means correctly drawn.

Though the works of this artiſt manifeſt great fertility of invention, they evince no very profound knowledge of compoſition, nor perception of the ſuſceptibilities of the engraver's art, and, therefore, but little judgment. He uſually marked his prints with his initials, or a monogram, which will be found in our third plate of thoſe uſed by the engravers of the Low Countries.

Of the numerous works of this artiſt, it may ſuffice to mention the following:—The Hiſtory of Elias and Elijah, in ovals of 4to. ſize. A ſet of landſcapes, with ſubjects from the New and Old Teſtaments, in 4to. Rural feſtivals, in folio; a company of archers regaling; a peaſant's wedding, both in folio. A landſcape with the hiſtory of Hagar and Iſhmael, in large folio; a folio print, entitled “Emblemata ſacra e præcipuis utriuſque Teſtamenti hiſtoriis concinnata;” and a ſet of one hundred and forty plates, from Ovid's metamorphoſes, in 4to.; printed and publiſhed at Antwerp by Theodore Galle.

Henry van der Borcht, the elder, was born at Bruſſels, A.D. 1583, and died at Frankfort in 1660, where his family were obliged to ſeek an aſylum from the political troubles which agitated their native country. His father, on diſcovering

ing his taſte for the arts, placed him under Giles Valkenbourg, from whom he learned the rudiments of art, and whom he afterward accompanied to Italy.

Italy was at that period at once the grave and conſervatory of ancient art; and ſculptural wonders were every day dug from the ruins of the claſſical ages. The knowledge and opportunities of vander Borcht during his reſidence in that country, enabled him to form a collection, which the Engliſh earl of Arundel had afterward the honour of purchaſing.

From Italy our artiſt returned to Frankenthal, where he reſided ſome time, and afterwards migrated to England, but finally returned to the Netherlands. His portrait was engraven by Hollar, from a picture by his ſon, who, being of the ſame name as his father, is often confounded with him; but the engravings which are moſt generally aſcribed to the former, are "The Holy Virgin and Child," after Parmegiano, engraved at London in 1637, in ſmall folio. "A Dead Chriſt, before the Entrance of the Sepulchre," in 4to. after a copy by Parmegiano from Raphael's original, in the Arundelian collection. And a ſet of twenty-two in ſmall folio, of which the ſubjects diſplay the entrance of the elector palatine Frederic, with Elizabeth, the princeſs royal of England, into Frankenthal. It was accompanied with deſcriptions by Miroul, and was publiſhed in the year 1613.

Henry vander Borcht, the younger, was born at Frankenthal in the year 1620, and was the ſon of the preceding artiſt. At an early period of life he appears to have diſcovered talents both as an artiſt and an antiquary. The earl of Arundel, when on his travels, found Henry at Frankfort, and ſent him into Italy to Mr. Petty, who was then collecting art and antiquities for his lordſhip, and hence he was retained in the ſervice of that nobleman as long as he lived.

After the death of his patron, Van der Borcht was employed by the prince of Wales, (afterwards Charles II.) and lived in eſteem at London, but afterwards returned to Antwerp, where he died at an advanced age. The portrait of Vander Borcht, the younger, was engraved by Hollar, after J. Meyſens, and his monogram will be found among thoſe of our engravers of the Low Countries.

The following engravings, which are chiefly from the Arundelian collection, are attributed to him. "Abraham entertaining the three Angels," after Louis Caracci; "The Infant Chriſt embracing St. John," copied from a print by Guido; "A female Figure offering a Cup to another who is kneeling," after Correggio; and "Apollo and Cupid," in an oval; all of 4to. ſize. This artiſt uſed a monogram, for which ſee our *Plate* III. of thoſe uſed by the engravers of the Low Countries.

Count Henry Goudt, of whom we ſhall next treat, is among the rare inſtances that art may boaſt, and that Fortune in her caprice has allowed us to exhibit, the tenour of whoſe life and purſuits is in direct hoſtility to an ungenerous and immoral maxim, which, promulgated by the proud and unfeeling among lax philoſophers, has obtained but too much credit and currency throughout Europe.

The maxim to which we here allude, is, that the goadings of the iron (which ſophiſtry has miſnamed the golden) ſpur of neceſſity is indiſpenſable to the due progreſs of genius. Count Goudt was born in affluent circumſtances, and of a noble family, and yet became a great artiſt, as well as an exemplary man.

Among that claſs of ſociety, toward which meritorious profeſſors of the fine arts are allowed to look for patronage and encouragement, are ſome—always more conſiderable from their rank and infectious example, than from their numbers—that would juſtify the perverſion of riches and of reaſoning, by perverting Nature alſo, and who, miſtaking what might poſſibly be applicable to the exertions of mere manual induſtry, for the ſprings of mental expanſion, imagine, and inculcate with all the luxurious languor of infinite complacency, that the plants of genius thrive beſt in a rugged ſoil; that the chilling damps of poverty ſupply the ardours of talent; that ſtarvation is the very pabulum of ability; and that mind ſoars the higher for being chained to the earth. Before theſe intellectual arithmeticians of exquiſite feeling and refined liberality, proceed to calculate by what inverſe ratio of diſcouragement the apotheoſis of genius may be conſummated in the extinction of its final ſpark, it might be well for them to attend to the leading traits which mark the life of this diſtinguiſhed engraver.

Henry de Goudt, knight of the palatinate, and uſually called (but whether by courteſy or by right we are ignorant) count Goudt, was born of a noble family at Utrecht, in the year 1585.

Among the few profeſſions which, from the ſtate of European manners and philoſophy, are allotted to gentlemen of a certain rank, young Goudt obſerved, that in the army officers were, by the very nature of the tenure by which they held their commiſſions, obliged to reſign the nobleſt characteriſtic of their nature as men,—namely, the privilege of judging for themſelves; and reſign it too, in caſes touching the lives and liberties of others, which of all poſſible caſes are the moſt intereſting and important to minds of feeling. Young, and active-minded, but tender-minded, as he was, he could not but perceive, that ſoldiers became at once, from the eſſential nature of military ſervice, that degraded rank of beings, which philoſophic patriotiſm itſelf reluctantly glances at, and almoſt fears to call the ſlaviſh inſtruments of the deſtruction of their fellow men. A ſtate of ſociety, and a principle of mental and corporeal occupation, which converts the horror of philanthropy into the baſis of merit; which requires that men, for the ſake of being termed military officers, and the falſe glory that accrues from it, ſhould abdicate their own natural rights and powers of reaſoning on the juſtice of the cauſes of national quarrel in favour of hereditary rulers, however feeble-minded, or ignorant, or ill adviſed, was not, could not be, the voluntary choice of a mind attuned to the harmonies of art and nature.

In the church, our uncontaminated youth ſaw, that though religion was not denied to be an affair between individual man and his Creator, yet that no public teacher might think and act for himſelf, unleſs he voluntarily embraced the trammels of epiſcopacy, without incurring the reproach and the penalties of heterodoxy.

The law was repulſive, inaſmuch as principle was rather overwhelmed and endangered, than recognized and refreſhed, and ſuſtained, in acts of memory and the ſophiſms of rhetoric.

Of the ſtudy and practice of medicine, Goudt might with juſtice think much more favourably: yet, to produce good, was better than to remedy evil. But in preferring and following the proper objects of imitative art, to which it may have been, that the natural bent of his genius ſtill more inclined him than this proceſs of ratiocination, he anticipated the lofty, and independent, and virtuous, ſatisfaction of contributing the utmoſt of his pleaſurable exertions, free from the reſtraints of human tyranny, to the pleaſure and improvement of his countrymen: and as he could do this with dignity and delight, he heſitated not long in reſolving to become an artiſt; and with this view, and ample means of accompliſhing his object, he ſet forth on his travels to Italy, at that time the great hieropolitan temple, the ſanctified centre of pilgrimage, where, from all parts of the civilized world, met the devotees of art.

The wonders of Rome, the miracles of art which he there beheld, called forth all his enthuſiaſm; but taught him to hope humbly. He applied himſelf with aſſiduity to the practical ſtudy of art; and drew diligently in the Roman ſchools: but under what maſter he learned the rudiments of engraving is not known. Nor is it ſurpriſing that the progreſs of his improvements was rapid; for this will ever be the caſe where the mind of a ſtudent is operated upon by pleaſurable ſtimuli alone, and is free from the reſtraints and pecuniary obſtructions by which the advancement of a large majority of artiſts is ſadly retarded.

In this great metropolis, ſurrounded and pervaded as it is by an highly ſalubrious atmoſphere of art, every mind devoted to ſuch purſuits, freely inſpires and imbibes what is congenial to its nature. Adam Elſhiemer of Franckfort, of whom we have treated in vol. xiii., had been ſtudying there for ſome years when our young artiſt arrived, and the admiration with which he beheld the works of that great painter, gradually brought them acquainted.

Another circumſtance contributed much to increaſe their intimacy. The misfortunes of Elſhiemer had been pitied, but not relieved. Goudt had the happineſs of releaſing him from priſon, and of becoming at once the firm friend, pupil, and generous benefactor of the man in the world, to whom, of all others, he looked up with the moſt heartfelt reverence.

From this period he ſtudied under the direction of Elſhiemer, and appears to have excluſively devoted himſelf to the taſk of engraving after his pictures. We know not of a ſingle work of Goudt's that is engraved after any other maſter.

From this period, too, his peculiar talent for engraving began to develope itſelf. By comparing nature with the exquiſite productions of his maſter, he formed an original ſtyle of engraving, in moſt (though we think not in all) reſpects perfectly homogeneous with that of Elſhiemer's painting, and which diſcovers deep and clear inſight into the recondite energies of the engraver's art. No man before Goudt had produced thoſe bright, ſudden, and powerful effects of chiaro-ſcuro, which we behold with ſo much gratification in his fire, moon, and torch, lights, from which the engravers of the preſent, and of after ages, may ſtudy with advantage. No man, like Elſhiemer, had dipped his pencil in the depth of night, and in the dawn of morning. And no man before Goudt, and ſcarcely any ſince, has been able to ſuggeſt, in his engravings, the ſhades between dubious and poſitive colour which then prevail.

His "Aurora" is, in this reſpect, a perfect maſter-piece. The ſcene is a bird's-eye view, or rather a view from an eminence, over a hilly and extenſive country: but the freſhneſs of a ſummer's morning, at the early hour of day-break, is rendered with poetic felicity. It is, in the words of Gray, an

———" incenſe-breathing morn."

And the charmed ſpectator ſees the miſts exhaling, and liſtens with a poet's ear to the hymn of inanimate nature.

All had hitherto been enjoyment with count Goudt. As Virtue beckoned him forward, Pleaſure attended his ſteps, and ſtrewed his path with flowers. But earth is not heaven, and ſublunary happineſs is rarely of long continuance. It was the ill fortune of our artiſt to live during the Aurora of rational philoſophy, when ſir Francis Bacon had not ſhone forth, and myſtery and credulity were not diſſipated. He remained at Rome as long as Elſhiemer lived; but on his return to Utrecht, a ſuperſtitious female, by whom he was beloved, the Medea of the town, believing in the occult virtues of herbs and minerals, when combined with judicial aſtrology, to controul or inflame the paſſions, adminiſtered, at an entertainment, what was termed a love potion, which ſhe fatally believed would have the effect of fixing his affections on herſelf; and thus literally poiſoned his cup of delight. He was from this time afflicted with a ſpecies of delirium, or idiotiſm, of the moſt melancholy character, under which he languiſhed for ſome conſiderable time, and at length died in his native city, at the age of forty-five.

It has been remarked as extraordinary, but is probably only an ordinary denotation, and reſult of the maſter-paſſion, that though the mind of Goudt was loſt to every other intereſt; yet, when fine art became the ſubject of converſation, he would diſcourſe upon it in a very rational manner.

By thoſe who do not narrowly examine his prints, it will ſcarcely be credited that the graver was the ſole inſtrument of his art, ſo remarkably looſe and free is his delineation of the forms of uncultivated objects. A ſtriking inſtance of this, may be ſeen in the vine-leaves, and other foliage, near the door of the cottage where Ceres is drinking from a pitcher. His effects are always powerful, and his ſhadows produced by neat and numerous croſs-hatchings; ſo that in very dark receſſes he ſometimes has not fewer than five courſes of lines. In commenting on the above print, Strutt obſerves, that, "conſidering the preciſion with which he executed his engravings, the freedom of handling the graver, which may be diſcovered in them, is very aſtoniſhing. The weeds, and other parts of the fore-ground in that admirable print of Ceres, are very finely expreſſed. The heads of the figures are correctly drawn, and the other extremities are managed in a judicious manner. The powerful and ſtriking effect of this engraving cannot be properly deſcribed. The very deep ſhadows are perhaps rather too ſudden upon the ſtrong lights in ſome few inſtances; but in the fine impreſſions this is by no means ſo conſpicuous as in thoſe after the plate had been re-touched."

His engravings, from the elaborate neatneſs and care beſtowed on them, could have been but ſlowly produced; when we reflect, too, that his object was to excel other men in the merit, not the number of his prints; that he followed this art only for the pleaſure it afforded, and did not engrave when his mind was not attuned to the purſuit, it will not appear ſurpriſing that the number of his performances ſhould be ſo ſmall.

The following ſeven are generally enumerated as being the whole of his works; they are all after the paintings of his friend Elſhiemer; but the collection of Mariette contained nine, which, at a public auction at Paris, were ſold for two hundred and ſeventy livres.

1. The Ceres mentioned above, in ſmall upright folio, which is by ſome diſtinguiſhed by the title of "The Sorcery;" 2. The Flight into Egypt, in folio; and a landſcape (with ſmall figures) in which the effects of fire-light and moon-light are contraſted with great ſkill; the ſtars alſo ſhine forth, and the *via lactea* is faintly diſcernible. 3. Another landſcape, in ſmall folio, in which the angel and Tobit are introduced. The weeds on the fore-ground of this engraving, and the branches of the trees in front, as well as the foliage and weeds hanging from them, are beautifully expreſſed. On this print an obſervation has been made which is applicable alſo to ſeveral paſſages in the other engravings of Goudt; namely, that he fails in the diſtant woods, which gradate one

from another, and require that freedom of determination which etching alone can give.

Of the ſubject of “Tobit and the Angel,” there are two prints by this maſter. In the firſt, Tobit is dragging the fiſh along; in the ſecond, which is of 4to. ſize, he holds the fiſh under his arm, whilſt, with Raphael, he is croſſing a ſtream of water by means of ſtepping-ſtones. 5. Baucis and Philemon entertaining Jupiter and Mercury, in 4to. dated 1612.

6. The Aurora, upon which we have commented above, and 7. A very ſmall oval print of “The Decollation of St. John the Baptiſt,” are all the engravings, by this maſter, with which we are acquainted, and the laſt, which is of the leaſt intrinſic value, is by far the ſcarceſt. Perhaps the additional two that were in the collection of Mariette were nothing more than juvenile attempts of our artiſt.

Of Robert Vander Voerſt, the meritoriuos rival of Vorſterman, we have already treated at ſome length. (See ENGLISH *Engraving, Origin and Progreſs of.*) He was a native of Arnheim, and born in the year 1596.

Michael Natalis was born at Liege in the year 1589. He was inſtructed in drawing by Joachim Sandrart, but learned the rudiments of engraving at Antwerp of Charles Mallery. From Antwerp he travelled to Rome, where he joined Cornelius Bloemart, Theodore Matham, and Regnier Perſyn, (all artiſts from the Low Countries), and aſſiſted them in completing the ſtatues and buſts of the Juſtinian gallery, conſiſting of one hundred and fifty prints. Stimulated by emulation, and aſſiſted in his ſtudies by Bloemart, Natalis now made conſiderable progreſs in his art. He engraved many other plates from the pictures of the great maſters of Italy; and after his return to Flanders, was invited to Paris, where he reſided a conſiderable time. Natalis engraved ſomewhat in the ſtyle of Bloemart: his prints have merit; yet the ſquare-grained mode of execution, to which he was partial, does not happily expreſs fleſh or drapery, but is rather adapted to the repreſentation of ſtone.

When he quitted this open ſquare manner, which was very ſeldom, his prints were mellow and ſoft; but the heads of his figures want character, and the other extremities are but indifferently drawn. He frequently combined his initials in a monogram, for which, ſee *Plate* III. of thoſe uſed by the engravers of the Netherlands. His portraits are the moſt eſteemed productions of his graver, from which we ſhall ſelect the following as being moſt worthy of the reader's attention.

Portraits.—Joſephus Juſtinianus Benedicti Filius; Jacob Catz, a Dutch poet; Eugenius d'Alamond, biſhop of Ghent, in large folio; Maximilian Emanuel, elector of Bavaria, after his firſt maſter; Joach. Sandrart; and Frederic, count of Merode, both in large folio; Gabriel Maria, theologiſt, from Abr. van Diepenbeck; Erneſtine, princeſs of Ligne, and counteſs of Naſſau, from Ant. Vandyke; and the marquis del Guaſt as Mars, with his miſtreſs, in the character of Venus, after Titian, all in folio.

Hiſtorical, after various Maſters.—“The Holy Family,” from Raphael, in large folio; “The Virgin and Child, with Joſeph ſeated behind, leaning his Head on his Hand,” after Andrea del Sarto, in folio; “The Holy Family,” a grand compoſition, from Pouſſin, in large folio: the firſt impreſſions are before the nudity of the infant was covered with linen. “The Extacy of St. Paul,” from a picture by the ſame painter, belonging to the cabinet of the kings of France; “The Holy Family, with Angels ſcattering Flowers over the Head of the Infant Chriſt,” from Seb. Bourdon; “The Marriage of St. Catherine,” from the ſame painter, all in large folio; “St. Bruno at his Devotion,” after Bertholet Flemel; “The Aſſembly of illuſtrious Eccleſiaſtics,” a large print, lengthways, engraved on four plates, from the ſame painter; “Mary waſhing the Feet of Our Saviour,” from Rubens, a large folio plate; “The laſt Supper,” in folio, from Diepenbeck; “St. Francis,” in large folio; “St. Henry;” and “St. Cunegonde,” in folio; and an allegorical Theſis, dedicated to the emperor Ferdinand III., on two large plates, all from the ſame maſter.

John Valdor was born at Liege in the year 1590, and reſided during the greater part of his life at Paris. He does not appear to have been a man of any genius, or of much talent: he wanted that animation which is neceſſary to form a great artiſt; inſtead of which, in him was ſubſtituted a painful laborious attention to the neatneſs and preciſion of the mechanical part of his plates, and in this reſpect he has ſucceeded, ſo as in ſome inſtances to excite our ſurpriſe. In France he engraved part of the plates for a book, entitled “The Triumphs of Louis the Juſt,” a work which conſiſts of forty-nine engravings, and which was printed at Paris A.D. 1637, in one folio volume; the few following are likewiſe by his hand, all ſmall upright plates; “Jeſus filius Dei;” “Ecce Ancilla Domini;” “St. Catharine;” “Regnum Mundi;” “Jeſu Chriſti;” “Virgo Gratia Valentina Miraculis Clara;” “The Head of St. Ignatius of Loyola,” the face of which is ſo neatly executed, that the dots which blend the lights with the ſhadows, are hardly perceptible to the naked eye: and “A Holy Family repoſing,” in folio, from Herm. Swanevelt.

Cornelius Schut was born at Antwerp, A.D. 1590, and died in the ſame city in 1660. He was the diſciple of Rubens, and painted hiſtorical and poetical ſubjects with much ſucceſs. Schut likewiſe handled the point in a very free ſpirited ſtyle, reſembling that of Caſtiglione, but bolder and more determined. The drawing of the naked parts of his human figures is often incorrect, but the characters of his heads are generally expreſſed in a maſterly manner. From his numerous etchings we ſelect the following:—A ſet of one hundred and thirty-three prints of various ſubjects and dimenſions, from his own deſigns; four Virgin Maries, half-length figures, in 12mo.; “The Holy Family, accompanied by St. John;” “The Virgin and Holy Infant;” “Chriſt on the Mount of Olives;” “The Virgin ſurrounded with Rays of Glory, and worſhipped by the Saints of Paradiſe,” all in folio; “Mars, Venus, and Flora,” a ſmall upright oval; and its companion, “Bacchus, Ceres, and Pomona;” “A Sacrifice to Venus;” “The Triumph of Peace,” and “The Triumph of Neptune,” all of folio ſize; and “The ſeven liberal Arts,” a ſet of eight middling-ſized plates, lengthways.

This artiſt is ſometimes confounded with his nephew Cornelius Schut, who was director of the Academy at Seville, and a portrait painter of ſome reputation; but the latter is not known to have engraved at all.

Cornelius de Wael, or Waal, was born at Antwerp in the year 1594, and died at Genoa in 1662. His father was a painter, and he learned the elements of art under his paternal roof; but afterwards travelled to Italy, and ſtudied under various maſters. He painted battles, landſcapes, and hiſtorical ſubjects, with great ſucceſs; and was patroniſed both by Philip III. and the duke of Arſchot.

De Wael engraved ſeveral of his own compoſitions in a very ſpirited ſtyle; his figures have much expreſſion, and are very correctly drawn, and his chiaroſcuro is better than that of the majority of his contemporaries. Among his beſt etchings are, a ſet of ſeven, intitled “Ilbri. D.D. Guilielmo Vander Stradan, venuſtas haſche imagines, C. de

Wael amoris dicat." 1. Repreſents a fountain playing on ſome figures who are running to avoid it. 2. Hunters halting at an inn door. 3. Peaſants beating an overladen aſs. 4. A quack doctor ſhewing ſpecimens of his ſkill at the door of a tavern. 5. Peaſants before an alehouſe door. 6. A man on an aſs, and ſpectators laughing at him. 7. An aſſembly of people of rank of both ſexes; and a tennis-court with peaſants fighting; a ſmall plate lengthways.

Cornelius had a nephew, John Baptiſta de Wael, who engraved ſeveral of the pictures of his uncle, and among them "The Life of the Prodigal Son," in eight ſmall upright plates.

Lucas Van Uden was born at Antwerp in the year 1595, and became a very diſtinguiſhed painter and engraver of landſcape. He was inſtructed by his father, who was alſo an artiſt, but, by his accurate obſervation of nature, Lucas ſoon ſurpaſſed him in merit. He particularly ſtudied, and was happy in repreſenting, the various effects of ſun-ſhine, from the firſt dawn of morning till his light feebly glimmers in the evening horizon. Rubens ſaw his landſcapes with admiration, and ſometimes peopled them with figures, while Van Uden returned the favour by occaſionally painting the landſcape back-grounds of that great maſter. His ſkies and diſtances are beautifully clear and finely toned, while of his trees it has been ſaid that their foliage was ſo looſely pendant, that it ſeemed ſwayed by the motion of the air.

Van Uden etched many of his own compoſitions, and ſome few plates from thoſe of other painters, with great delicacy, ſpirit, and freedom. Huber thinks that his prints merit not leſs praiſe than his pictures. Among them may be diſtinguiſhed three pair of ſmall, but beautiful, landſcapes, conſiſting of village ſcenery adorned with trees and figures. A landſcape of paſtoral character, on the fore-ground of which is a piping ſhepherd with his flock. A landſcape with a wooden bridge and two windmills. A landſcape adorned with travellers, with a woody fore-ground, and the city of Antwerp in the back-ground. A landſcape with figures carrying a litter, in folio. Four fine landſcapes after Rubens, in ſmall folio, the earlieſt impreſſions of which are without the name of the painter. 1. A landſcape, and figures converſing. 2. Cows in a river, and a man bringing horſes to drink. 3. A landſcape, with water, cows, and figures. And 4. A landſcape, in which are two women with baſkets. A landſcape, into which a holy family is introduced; and another with the good Samaritan, both in folio, after Titian.

Of that well-known and very diſtinguiſhed artiſt, Jacques Jordaens, we have already treated as a painter in our nineteenth volume. (See JORDAENS.) His biographers have ſtated, that his early marriage prevented that journey to Italy, which was at the time eſteemed an almoſt indiſpenſable part of the education of an artiſt. Whatever cauſe kept him at home, taught him to depend leſs upon other men, and more upon nature and himſelf, and to this it is probable, that if we owe his low choice of ſubjects, we owe alſo the vigour by which his productions are characterized.

His etchings are haſtily performed, but glow with the fire, and teem with the intelligence of a maſter. According to Hecquet, who has favoured the public with a catalogue raiſonée of the works of Jordaens, they are thirty-three in number, and Huber has juſtly regretted "that they are not more numerous, as they rank with the fineſt productions of the Flemiſh ſchool."

In collecting theſe etchings, which are all from compoſitions by Jordaens himſelf, the connoiſſeur will bear in mind, that the earlieſt and beſt impreſſions are inſcribed with the words "cum privélegio."

Of the thirty-three prints mentioned by Hecquet, we are only able to enumerate "The Flight into Egypt," dated 1652; "Jeſus Chriſt expelling the Money-Changers from the Temple;" "The Deſcent from the Croſs;" "Mercury beheading Argus;" "Jupiter and Io;" "The Infant Jupiter ſuckled by the Goat Amalthea;" "A Peaſant arreſting an Ox by the Tail, amidſt a great Concourſe of Spectators." Theſe are all in ſmall folio, and engraved in the courſe of the ſame year, namely 1652. "Saturn devouring his Children;" a very rare 4to. plate, without any name or cypher, is alſo attributed by moſt connoiſſeurs to the hand of Jordaens.

John Percelles, the pupil of H. Cornelius de Vrooms, was born at Leyden in the year 1597. His ſon Julius was a native of the ſame city, and both excelled in painting and engraving ſhipwrecks, and other marine ſubjects. From the circumſtance of the works of the father and ſon being marked with the ſame initial letters, ſome confuſion has ariſen; nor is it known whether to attribute the twelve ſmall ſea views which bear theſe initials, to John or Julius.

Another ſet of twelve in folio, of which the ſubjects are the Dutch navy, are etched in a ſomewhat broader ſtyle, and are moſt likely the performance of the elder Percelles, being inſcribed "Notatæ a famoſiſſimo Navium Pictore Johannes Percelles," without any ſeparate mention of the engraver's name.

Roland Rogman, or Roghman, was alſo born at Leyden in the year 1597, and died there in 1685, or 1686. He was an original artiſt; he ſtudied under no maſter, but formed his ſtyle, both of painting and etching, from the ſtudious contemplation of nature only. His pictures are ſpoken of with great commendation, and he etched ſeveral landſcapes, which conſiſt chiefly of views in Holland and the Low Countries, in a ſketchy, but maſterly ſtyle.

Among them may be diſtinguiſhed "A View of the Caſtle of Zuylen," in folio; a pair of ditto with bridges and canals, &c. in 4to. A ſet of four mountainous landſcapes and figures, in 4to.; and another pair of town views, in folio

Gertrude Rogman is believed to have been of the ſame family with Roland, after whoſe pictures ſhe executed ſeveral engravings, among which is a ſet of four in ſmall folio, of the domeſtic occupations of the fair ſex.

The family of Van de Velde are of great celebrity in the annals of fine art. Eſaias, or Iſaiah, was born at Leyden, A.D. 1597. He became the diſciple of Peter Deneyn. With what talent he painted landſcapes and battles will be ſpoken of in our biography of VAN DE VELDE, as a painter. His etchings, which are executed with conſiderable firmneſs and intelligence, are rare, and, what is much better, are of intrinſic value. A landſcape, with peaſants drinking on the fore-ground, in folio. Another of quarto ſize, with a bridge and round-tower, in which is introduced a ſhepherd and ſhepherdeſs tending their flocks. Another, with cottages among ruined architecture; and another of paſtoral character, with a ſhepherd's hut near the fore-ground, of folio dimenſions, are all we are able to enumerate of the engravings of Iſaiah Van de Velde. He ſometimes combined his initials in a monogram, which will be found in *Plate* III. of thoſe uſed by the artiſts of the Low Countries.

John Van de Velde, brother of Iſaiah, was born in the ſame city, and in the following year; and though a painter of great merit, is, perhaps, better known by his excellent engravings; which are numerous, and are executed in two diſtinct and very different ſtyles.

The etchings he produced are very bold and determined. The lights are kept broad and clear; but perhaps the ſhadows may, in ſome inſtances, want ſtrength; however, the hand of the ſkilful maſter is evident in all of them; and the ſmall figures which are occaſionally introduced, prove the goodneſs of his taſte, by the ſpirited manner in which they are executed.

His other ſtyle of working was with the graver, aſſiſted occaſionally with the dry point; theſe prints are exceſſively neat and laboured, and reſemble thoſe of count Goudt in the vigour of their general effects; they conſiſt chiefly of ſcenes by candlelight, and ſuch ſubjects as require great depth of ſhadow; yet, with all the merits which they poſſeſs, they are not, on the whole, equal to his etchings; for whatever advantages may appear to be gained in neatneſs and toning, are loſt in their want of that ſpirit, lightneſs, and freedom by which his etchings are characteriſed.

The following will probably be found moſt worthy of the attention of the connoiſſeur: beginning with his portraits: John Van de Velde, himſelf, in large quarto; Jacob Matham, from P. Soutmans; John Torrentinus, a very fine and rare print, in large quarto; John Crucius, a clergyman of Haerlem, of the ſame ſize; Michael Middelhoven, F. Hals, pinx. in quarto; John Acronius, theologian, in folio; Jacob Zaffius, archdeacon of Haerlem, in folio, both from the ſame painter; John Oven, (engraved in mezzotinto); John Iſaccius Pontanus, hiſtorian, both in 4to.; Charles, duke of Troppau and Jaegerndorf, in folio; Oliver Cromwell, a very rare portrait, in large folio; and Lawrence Coſter, of Haerlem, with a long Latin inſcription, in 4to.

Hiſtorical Landſcapes.—“The Adoration of the Kings,” after P. Molyn. In this engraving the effect of night is well managed. “The Magic Lanthorn,” after the ſame painter; “The good Samaritan;” “An Old Woman frying Pancakes, and Boys eating them,” all in ſmall 4to.; “A Peaſant and his Wife going to Market, at Day break, with Cows and Goats,” in folio; a landſcape with ruins, and a cow-herd tending cows, in octavo; “The Mountebank expoſing his Medicines,” a capital print; “The Gameſters,” with a ſtriking candle-light effect, both in folio; “A village Feſtival,” a very rich compoſition; two landſcapes, one repreſenting buildings and travellers by moonlight, the other ſun riſe, and travellers; two landſcapes, one with figures fiſhing by moonlight, and villagers warming themſelves by a large fire, the other travellers by ſun-riſe, in folio; four ſubjects from the Hiſtory of Tobit, in 4to.; the four parts of the day, very beautifully finiſhed plates; the four elements, after W. Bugtenwegh, in folio, with very fine effects; the four ſeaſons, in large folio; a different compoſition of the ſame ſubjects, in large folio; the twelve months of the year, in quarto; another ſet of the ſame ſubjects, engraved in a broader ſtyle; a champaign country in Holland, with robbers attacking a coach at the entrance of a wood; a champaign in Italy, with buildings and water, after P. Molyn the younger, or the chevalier Tempeſta, both in large folio; an open country, with ruins and travellers, in folio; the bridge of St. Mary at Rome, in large folio; a view of the caſtle of Bruxelles, a very large and rare print; and a ſet of landſcapes, intitled “Playſante Landſchappen,” all of folio dimenſions.

Adrian Van de Velde was born at Amſterdam, A.D. 1639, and died in the ſame city in 1672. He was the nephew of John, whom we have juſt diſmiſſed, and the diſciple of Wynants. As a painter he will be treated of in a future volume.

To ſpeak of him as an engraver, we have, by this maſter, a ſet of twenty etchings, executed in a very free and ſpirited ſtyle, of cattle and peaſantry. Another ſet of ten plates of groups of cows and other domeſtic animals, with a bull for the title page; three plates of ſheep; the return from hunting, in quarto; a large landſcape, lengthways, and a ſmaller one of the ſame form, enriched with hiſtorical figures, both rare prints, but the latter by much the rareſt.

John Miel was born in a village, near Antwerp, in the year 1599, and died at Turin in 1664. He learned the rudiments of art of Gerard Seghers, and afterwards travelled to Italy for improvement, where he ſtudied in the ſchool of Andrea Sacchi.

By contemplating the beſt works of the Italian maſters, he by degrees emancipated himſelf from the trammels of his earlier education, and formed a ſtyle of art for himſelf, in which the general characteriſtics of thoſe of Flanders and Italy, were happily blended.

The talents of Miel, and the reputation which followed and brightened their exerciſe, induced Charles Emanuel, duke of Savoy, to invite him to Turin. Under the patronage of this nobleman he remained five years, and the duke was ſo fond of our artiſt, that he inveſted him with the order of St. Maurice, and preſented him with a diamond croſs of great value; notwithſtanding which favours, he languiſhed in vain to return to Rome. Rome was the place where he had beheld thoſe objects that firſt expanded his mind with the pleaſures of art. Hence his wiſhes to return thither, and hence the regret which is by ſome ſuppoſed to have ſhortened his days. If he gained honours, he had ſacrificed liberty and independence at their ſhrine, and did not, therefore, enjoy them.

Miel etched ſeveral plates from his own compoſitions in a very maſterly ſtyle: and the figures which he occaſionally introduced are drawn with great ſpirit and freedom.

Among theſe are “The Aſſumption of the Virgin Mary;” “The Holy Family;” four paſtoral ſubjects, with ſhepherds and cattle, beautifully executed, in quarto, and an unknown number of battles and ſkirmiſhes for Strada's Wars of Flanders.

Philip Verbeck, or Verbecq, a Dutch engraver of ſlender talent, was born ſome time about the cloſe of the ſixteenth century. He is chiefly remarkable for having etched ſome plates in a ſcratchy manner, which bears inferior reſemblance to the ſtyle of Rembrandt.

Inferior, as is this reſemblance, it has led ſome collectors into the error of purchaſing his works and placing them in their Rembrandt portfolios. Gerſaint firſt informed them of their miſtake, and by comparing Verbecq's etchings with thoſe of Rembrandt, not only the name or cypher of the former artiſt may be obſerved, but the dates alſo of his engravings, which ſhew that he was anterior to Rembrandt, and therefore, at leaſt, not a copyiſt.

The following are all we are able to ſpecify from the hand of this artiſt, and which are much ſought after. “Eſau ſelling his Birth-right;” “An eaſtern King, ſeated on his Throne, with a Suppliant kneeling before him,” both in 4to; “A Shepherd, ſeated at the Foot of a Tree;” a buſt of a young lady in a bonnet and peliſſe; and a three-quarter portrait of a nobleman in a tartan and feathers, (companion to the above,) all in ſmall ovals.

Rodermondt, Rottermondt, or Rottermans, with whoſe Chriſtian name we are unacquainted, was alſo of Holland, and born in the year 1600. He etched ſeveral portraits and ſome other plates much in the manner of the preceding artiſt, and with at leaſt equal freedom and ſpirit. Among theſe are ſir William Waller, major-general of the parliamentary army, with a battle in the back-ground, after C. Janſen; John the ſecond, a celebrated Latin poet, a very rare print, inſcribed "Joannes ſecundus Hagienſis Poeta. Rodermont fecit," in large 4to.; a three-quarter view of a man with a curly beard, (this print, which is not above mediocrity, is in the ſtyle of Rembrandt: by Gerſaint it is attributed to Verbecq, and by Bartſch to Rodermont); and "David praying," with his harp and turban beſide him, in 4to.

Peter van Sompel, or van Sompelin, was born at Antwerp in the year 1600; and became the pupil of Soutman, whoſe ſtyle he always copied. He drew correctly, and treated the naked parts, and eſpecially the extremities of the human figure, with intelligence. He engraved in a neat laboured ſtyle, eſpecially his portraits after Vandyke and Rubens, among which the following will be found moſt worthy of notice.

Portraits.—Paracelſus, the celebrated phyſician, in folio; the emperor Adolphus of Naſſau, in large folio; Marianna de Bavaria, wife of the emperor Ferdinand; Henry, count of Naſſau, and Philip of Naſſau, prince of Orange, both in large folio; and all from Soutman. The emperor Charles V., from Rubens; cardinal Ferdinand, brother of Philip IV. governor of the Low Countries, from Vandyke; Iſabella Clara Eugenia, infanta of Spain; Gaſton John Baptiſt, duke of Orleans, brother of Louis XIII. and Margaret his wife, all from Vandyke. Philip the Hardy, duke of Burgundy, from Van Eyk; Frederic Henry, of Naſſau, from G. Honthorſt; all of large folio dimenſions.

Hiſtorical Subjects.—"Chriſt on the Croſs," a large upright plate, arched at the top; "Chriſt dining with the Pilgrims at Emmaus," in folio, nearly ſquare; "Erichtonius in the Baſket, diſcovered by Aglaurus and his Siſters," all from Rubens, and "Ixion deceived by Juno," from the ſame painter; all in large folio.

William de Leeuw was born at Antwerp, A.D. 1600, and flouriſhed in the Netherlands in 1650. He was a pupil of Soutmans, but did not engrave in his ſtyle; inſtead of which he employed ſhort playful ſtrokes, which produced a pictureſque effect, united with a tolerably good chiaroſcuro. Moſt of his engravings are from Rubens or Rembrandt, but in a ſet of large landſcapes after Nieulandt he has quite altered his manner of execution, and engraved the ground and ſky in a manner ſo delicate, that it requires good eyes to diſtinguiſh it from a tint of Indian ink.

De Leeuw commonly marked his prints with his initials, or a monogram, which will be found in *Plate* III. of thoſe uſed by the engravers of the Low Countries. The following are a ſelection of his beſt works: "Lot and his Daughters," in folio (the beſt impreſſions of this plate are before the name of C. Dankerts was inſerted); "Daniel in the Lion's Den," in large folio; the Holy Virgin kneeling, ſupported by angels, commonly called "The Virgin of Grief," a very rare print, in folio; "The Martyrdom of St. Catherine," a very fine and rare print, all after Rubens, and a ſet of four chaſes, from the ſame painter, namely, the chace of a lion and lioneſs; ditto of a wolf; ditto of a wild boar; ditto of a crocodile and hippopotamus; all in very large folio. "Tobit and his Wife," in folio, from Rembrandt. This print is executed in a very good taſte, and has a fine effect. "David playing the Harp before King Saul;" a half-length profile of Rembrandt's wife, both in large folio: the portrait of a female veiled, at the bottom of the print "Marianne" is inſcribed in capital letters; all after Rembrandt. A young man habited in a cloak, and a hat and feathers, in ſmall folio; "St. Francis meditating," a half-length profile, from Livens, in folio. And the following ſet in large folio, from Nieulandt, which are very rare and beautifully executed. A view in the Tyrol, with water, caſcades, and travellers. Another ſcene in the mountains of Tyrol, with travellers on horſeback; to the right a high mountain is crowned with the ruins of a temple, and on the plain below is a hermitage and two figures. A landſcape of the ſame character as the former, with wood and water; cows feeding on a plain and the effect of ſun-ſet. And another with fiſhers, and men on horſeback: on an eminence towards the right is a church, and on the plain below a village and ſheep feeding.

John Louys, or Loys, was born at Antwerp, A.D. 1600, he was the diſciple of Soutman, and engraved chiefly after the pictures of Rubens and Vandyke. There is a very fine engraving by him, with a powerful chiaroſcuro, of "The Reſurrection of Lazarus," from J. Livens, which is generally and juſtly regarded as his maſterpiece. From among the works of this artiſt, the following are moſt worthy of ſelection.

Portraits.—Philip the Good, duke of Burgundy, from Soutman; Lous XIII. of France, from Rubens, and its companion, Ann of Auſtria; Philip IV. king of Spain, from Rubens, and its companion, Elizabeth of Bourbon, his queen; and Francis Thomas of Savoy, prince of Carignano, from Ant. Vandyke; all of large folio dimenſions.

Hiſtorical, &c.—"The Reſurrection of Lazarus," (which is mentioned above;) "The Repoſe of Diana, or the Return from the Chace," from Rubens; "The Inſide of a Flemiſh Cottage, with a Woman ſcouring a Cauldron," after Oſtade; "Peaſants regaling," and "The Cheſnut Seller," after the ſame maſter, all in quarto; and "The Interior of a Dutch Kitchen," in which the principal object is a dead pig hanging up; in folio, after W. Kalf.

Jonas Suyderhoef, of Leyden, was another of the diſciples of Soutman, born in the ſame year with the preceding artiſt, but of very ſuperior abilities.

Suyderhoef purſued the ſtyle of engraving which had been invented or adopted by his maſter, but, by degrees, far ſurpaſſed him in the ſoftneſs and beauty of his finiſhing. He had the art of uniting great force, as well as harmony of chiaroſcuro, with conſiderable neatneſs of execution, and, where his ſubject required it, with great exactitude of detail. His engravings are juſtly held in eſteem by the experienced collector, and by all men of taſte. His portraits, of which he executed a conſiderable number, are exceedingly beautiful, and probably, on the whole, ſuperior to his hiſtorical works. His practice was, to bring them very forward in the etching, and afterwards ſtrengthen them, where deeper ſhadows were required, with the graver; imparting to them, at the ſame time, amenity of tone, and greater accuracy of reſemblance. Perhaps we ought to except from this general preference, his "Treaty of Munſter," after Gerard Terburgh, which is truly an hiſtorical engraving, though it conſiſts of an aſſemblage of the portraits of the moſt celebrated ſtateſmen of Europe, and of the age when that important treaty was concluded. The exquiſite picture, from which this plate was engraven, which form its rare merits, and its importance as a diplomatic and hiſtorical event, ought always to adorn a royal or a national gallery, was lately brought to this country, by Mr. de la Hante, and is probably ſtill in Pall-mall, in that gentleman's poſſeſſion. Not only the perſon and dreſs of every plenipotentiary who was preſent on that memorable occaſion, are here pourtrayed with the utmoſt delicacy of finiſh, but the place of meeting alſo, with every minutiæ of coſtume.

The profeſſional diligence of Suyderhoef was ſcarcely inferior to his extraordinary merit: this merit has, to a certain extent, been appreciated through Europe, and fine impreſſions of his beſt works are, in conſequence, become extremely rare. Mariette's collection of his works amounted to one hundred and eleven: nor are we certain that Mariette had collected the whole. From among theſe, it may be uſeful to diſtinguiſh the following, as thoſe which are more eminently worthy of the reader's notice.

Portraits.—Maximilian, archduke of Auſtria, in large folio; Philip III. of Spain, in ſmaller folio; Albert, archduke of Auſtria, and governor of the Netherlands; and his ducheſs, Iſabella Clara Eugenia, infanta of Spain, in large folio, all after ſir P. P. Rubens; Charles I. of England, and his queen Henrietta Maria; and Francis de Moncado, count of Orſonna, all in large folio, and after Vandyke; the emperor Maximilian I. and his empreſs Maria, both in folio, and after Lucas of Leyden; duke John, and duke Charles of Burgundy, after Soutman, of large folio dimenſions; Aidus Swalmius, an old man with a long beard, from Rembrandt; René Deſcartes, the celebrated philoſopher, from F. Hals; Van Bloemaerts, a half-length, ſeated at a table, with books and a crucifix; beneath is a long Latin inſcription, after Van Spronck: Mark Zucrius Boxhornius, of Bergenopzoom, profeſſor at Leyden, from Dubordieu; Adrian Heerebond, profeſſor of philoſophy, from the ſame painter; Jacob Maeſtertius, juris conſulte at Leyden, from Van Negre; Andreas Rivetus, profeſſor of theology at Leyden; Claude Saumaiſe, a famous critic, both from the ſame maſter; Noah Smaltius, a celebrated ſurgeon of Haerlem, after Th. Pas; Albert Kuperus, doctor of medicine at Leyden, after D. Bailly; John Coccejus, profeſſor of theology at Leyden, from De Vos; Conſtantine, tutor of prince Maurice of Naſſau, after Baudrigeen; Abraham Heydanus, a ſhepherd of Leyden, from Schooten; Daniel Heinſius, a Dutch hiſtorian, from Marck; Anna Maria Schurman, celebrated for her taſte and knowledge of the arts and ſciences, from J. Livens; John Beenius, theologian, from J. Vliet; Julius de Beyme, profeſſor of law at Leyden; and Pierius Winſemius, profeſſor of hiſtory, both without the painter's names, and all of folio dimenſions.

Hiſtorical, &c. after various Maſters.—"The Fall of the Damned," a large upright print, engraved on two plates, from Rubens; "The Virgin Mary, with the Infant Jeſus embracing her," in quarto; "A Bacchanal," a ſmall plate, lengthways; "A drunken Bacchus, ſupported by a Satyr and a Moor," a ſmall upright plate, half figures; "The Chace of the Lions," in large folio, very fine and rare, all after Rubens; a compoſition of "Satyrs playing with Tygers," the beſt impreſſions of which have a forcible and fine effect, after De Laer, in large folio; "The Return from a Country Excurſion," in large folio, after Berghem; "The Concluſion of the Peace at Munſter," containing the portraits of all the plenipotentiaries who were there aſſembled, a large folio plate, after Terburgh, very fine and rare; "A Quarrel of Dutch Peaſants," in large folio, after the ſame painter; another "Quarrel of Peaſants," after Van Oſtade, containing many figures; "The four Burgomaſters of Amſterdam," a folio plate after Th. Keyſer; "Three Old Women regaling," from the ſame maſter, in an oval of folio ſize; "Three Peaſants ſeated, one of whom plays the Violin," a fine and rare print in folio; "Peaſants gaming," in folio; "Peaſants regaling at the Door of an Alehouſe," in folio, all from Van Oſtade; "The enraged Drinkers," in large folio, from De Witt; "Peaſants quarrelling," in folio; and "Peaſants dancing at an Alehouſe," commonly called "The Ball," in large folio, all after De Wit.

William de Butenweg, or Van Buytenweck, was born at Rotterdam in the year 1600, and always reſided in that city. He painted converſational ſubjects and landſcapes. He likewiſe etched, in a good ſtyle, ſome few ſubjects from his own deſigns, of which we are able to mention only the following.

A pair, repreſenting "Young Villagers carrying Poultry to Market;" a ſet of ſeven, of "The Coſtume of Noblemen;" a ſet of ſix, of "The Coſtume of Ladies," all in octavo; and a ſet of ten landſcapes with ruins, trees, and figures, entitled, "Verſcheide Landſckapjes." Buytenweg marked his plates either with a monogram, which will be found among thoſe of the engravers of the Low Countries, or with his name at length.

George Henry Scheyndel, or Van Schiendel, was a native of Holland, the contemporary of Buytenweg, and we preſume was, like him, eſtabliſhed at Rotterdam. He engraved in a very neat, ſpirited ſtyle, very nearly reſembling that of Callot. His landſcapes poſſeſs great merit, and are ornamented with excellent little figures.

Scheyndel marked his prints with his initials G. V. S. We have, by him, "A Company of Peaſants, ſeated before a Houſe Door;" another "Company of Peaſants, with a young Pig and Chickens;" "A Dentiſt, at a Fair;" "The Execution of a Criminal," all in 12mo.; "A Village Fair," in octavo; another "Village Fair, with a Conjuror," of the ſame ſize; a winter landſcape, with ſkaiters; a landſcape, with a water-fall; another landſcape, with a bridge, figures, and animals; a ſet of four views of a caſtle, one of which has alſo a windmill; a ſet of eleven landſcapes, with Dutch inſcriptions, all in quarto; a ſet of the coſtume of the Grecians and Turks, in octavo; and a ſet of the habits of the countrywomen of the ſeveral cantons of Holland, twelve ſmall upright plates, from Buytenweg.

Peter de Molyn was born at Haerlem in the year 1600. For an account of his merits as a painter, as well as thoſe of his more celebrated ſon, ſee the article MOLYN, &c.

Molyn etched ſome few plates from his own compoſitions, in a good taſte, which are chiefly remarkable for their ſtriking effects of chiaroſcuro, and are very much ſought after by connoiſſeurs. A ſet of four landſcapes ornamented with very good figures, in folio; another ſet of four fine landſcapes, with cattle and figures, in large quarto; the ſtar of Bethlehem, with a very fine night effect, and the ſame ſubject otherwiſe treated (though not leſs ſucceſsfully,) both in folio; compriſe perhaps the whole of his etchings. All, except the laſt, are marked P. Molyn fecit.; but by ſome writers the two latter are ſaid to be by J. van de Velde.

This artiſt marked his engravings with his initials, in the form of a monogram, which will be found in our *Plate* III. of thoſe uſed by the engravers of the Netherlands.

The works of this artiſt have been confounded by Strutt with thoſe of his ſon Peter Molyn the younger, who is better known by his cognomen *Tempeſta*.

The younger Molyn was alſo a native of Haerlem, born in the year 1637, and, according to ſome of his biographers, was the pupil of Snyders, whoſe manner of painting he at firſt imitated.

Either the whirlwind of his violent paſſions, or, as ſome have expreſſed it, his genius, which led him to the ſtudy of ſtorms at ſea and other diſmal ſcenes, obtained for him the diſtinctive addition of *Tempeſta;* he was otherwiſe nicknamed *Pietro Mulier*, for a much worſe reaſon, but which ſtill has reference to the ungovernable and tempeſtuous character of his mind. He cauſed his wife to be aſſaſſinated, in order that he might be at liberty to marry a young lady of Genoa, with whom he was paſſionately in love.

However villainous this crime, and however incompatible with the purſuits of art, Molyn ſtands convicted of the full amount of its enormity. He was diſcovered, ſeized, impriſoned, tried, and capitally condemned. The greatneſs of his merit, however, as an artiſt, cauſed his ſentence to be mitigated. He ranſomed his life with the loſs of his liberty, endured an impriſonment of ſixteen years, and in all probability would have ended his days in captivity, but that the bombardment of Genoa by Louis XIV. afforded him an opportunity, which he failed not to embrace, of eſcaping to Placentia.

During his confinement, he conſoled himſelf with his profeſſional purſuits, and probably executed ſome of the engravings which have been aſcribed to him. Of theſe we are only able to particulariſe one which is in a ſtyle reſembling that of the elder Molyn and John van de Velde, the ſubject is a maſquerade by candle-light, with a ſort of mock proceſſion in the back-ground. Tempeſta died in the year 1710.

Albert Flamen was born in the year 1600, but in what part of Flanders we are unable to ſay. He acquired ſome reputation as a painter of landſcape and ſtill-life, but from the number of excellent prints he produced, is better known as an engraver. At one period of his life he reſided at Paris.

His prints are for the moſt part etchings, performed in a maſterly and ſpirited ſtyle, and finiſhed with ſmall aſſiſtance from the graver. They are marked with the monogram which may be ſeen in our *Plate* III. of thoſe uſed by the engravers of the Low Countries, and conſiſt principally of four ſets of various fiſh, with landſcape back-grounds, of ſea-ports, &c. engraved on forty-eight plates; a ſet of ſeven landſcapes and figures; a ſet of four views of Conflans, Pernay, Marcouſſi, and the Port à l'Anglois, all in large quarto; and a folio print of the encampment at the Fauxbourg de St. Victor.

Claas, or Nicholas, Wieringen, was born at Haerlem ſome time about the commencement of the ſeventeenth century. He was ſent to ſea in his youth; employed much of his time in ſtudying marine objects; and after making a few voyages, ſettled on ſhore, and became a painter and engraver of ſhipping and other marine ſubjects.

His prints conſiſt of etchings which diſplay much talent and feeling for art, and the ſubjects of which are ſea views and landſcapes, either drawn from nature or engraved from his own compoſitions; a ſet of ſix landſcapes of village ſcenery, with ruſtic figures, &c. in quarto, are very excellent plates, and are all we are able to ſpecify of the works on copper of this maſter.

Contemporary with Wieringen was Claas, or Nicholas, Moojaert, or Mooyaert of Holland, the happy imitator of Elſhiemer, and the inſtructor of Berghem, Vander Does, Koningh, and Weenix. The name of this artiſt has been variouſly ſpelled, and his hiſtory is obſcure; Baſſan firſt calls him Nicolas Moojaert of Amſterdam, and afterward Claas Moyard, a Dutch painter.

He etched ſeveral plates in a ſtyle bearing ſome reſemblance to that of Rembrandt, and as far as is known, worked entirely from his own compoſitions. Among his beſt prints are a ſet of ſix plates of animals, etched in apparent imitation of Swaneveldt; “Lot and his Daughters,” in that of Elſhiemer, and a landſcape with cows and ſheep, of various quarto dimenſions.

Chriſtian Louis Moyart was a native of the Netherlands, the time and place of whoſe birth are not known, but who was reſiding and practiſing engraving in the city of Amſterdam in the year 1630.

Among a few other works of no very extraordinary merit, he produced a ſet of monſtrous allegorical compliments, of folio dimenſions, wherein Hercules and Minerva appear quite out of their element, and which is entitled “An emblematical Hiſtory of Queen Mary de Medicis.” Moyart marked his plates with a monogram which will be found in our *Plate* III. of thoſe uſed by the engravers of the Low Countries.

Mathew Montagne, otherwiſe Plattenberg, was born at Antwerp in the year 1600, and died at Paris in 1666. He went at an early age to Italy, and made a long ſtay at Florence, where he engraved in concert with his countryman John Aſſelin. From thence he journeyed to Paris, where, for reaſons which we are unable to ſtate, he changed his name from Plattenberg, to Plattemontagne, and afterwards to Montagne. He painted ſhipping, ſea-views, and landſcapes, in a very good ſtyle, and acquired great reputation.

Montagne likewiſe etched ſome few plates of landſcapes and ſea-views, from his own pictures, in a ſtyle reſembling that of Fouquieres; of which the principal are as follow; a landſcape with buildings and figures; a ſea-port, with veſſels and figures, both of folio ſize; a pair of circular prints, one repreſenting veſſels on the ſea, and a light-houſe on a mountain; the other a landſcape with wood and water; a pair of landſcapes, one of which is ornamented with figures cutting wood; the other a canal with watermen, and a village, all in folio; and another pair, one of which has a village, trees, and three ſmall figures on the fore-ground; the other conſiſts of ruins and trees, without figures, in quarto; they are all marked M. Montagne in. et fec.

Nicolas Montagne, the ſon of Mathew, was born in the year 1631, and died at Paris in 1706. He ſtudied painting under Philip Champagne, to whom he was related; and engraving under Morin, whoſe ſtyle he improved upon. He painted portraits and hiſtory with ſucceſs, and in 1681 he was choſen profeſſor of painting of the Royal Academy at Paris. The moſt conſiderable work he engraved was a ſet of portraits, on which we find his name inſcribed, Nicolas de Plattemontagne. He drew the human figure very correctly, and his plates poſſeſs a very agreeable effect; we ſhall mention the following only, “Oliver de Caſtella,” a lieutenant-general, killed at the ſiege of Tarragone in 1644, in large folio; “St. Genevieve,” a whole length figure, after Ph. de Champagne, in folio; and “A dead Chriſt,” from the ſame painter; the figure is finely drawn, and the fleſh executed with dots only, but the back-ground and drapery are finiſhed with ſtrokes in a bold and free ſtyle, and is altogether a print of conſiderable merit.

William Akerſloot was born at Haerlem ſoon after the commencement of the ſeventeenth century. Under whom he ſtudied is not known, nor are his works entitled to rank above mediocrity.

He engraved portraits and hiſtorical ſubjects, and among others the following; Frederic Henry, prince of Orange, in folio; Amelia, princeſs of Orange, between her daughters, with a caſtle and figures in the back-ground, both after A. van der Venne; “Chriſt in the Garden of Olives,” after H. Hondius; “Chriſt loaded with Chains,” after P. Molyn; “The Denial of St. Peter,” after the ſame painter; and a large cartouche, with veſſels on the ſea, all in folio.

Moſes Uytenbroeck, ſurnamed Little Moſes, was born at the Hague in the year 1600. It is preſumed he was the diſciple of C. Poelenbourg, in whoſe ſtyle he compoſed, and ſometimes ſo exactly imitated him, that his pictures have been ſold for the works of that artiſt. He painted landſcapes, which he uſually embelliſhed with ſubjects taken from the Greek and Roman poets. We have by this maſter many engravings of landſcapes from his own compoſitions, they are executed in a taſteful ſpirited ſtyle, but the figures which he ſometimes introduced are incorrectly drawn. We ſhall mention the following as being moſt worthy the notice of the collector; "Diana diſcovering the Incontinence of Caliſto," in 4to.; and its companion, "A Female ſhowing to her Child Tobit blind, ſeated at the Door of his Houſe," very beautiful engravings; "Hagar in the Deſart comforted by an Angel;" "Mercury and Argus," both in 4to; a ſet of "The Hiſtory of Tobit," in four landſcapes; a ſet of ſix landſcapes with hiſtorical figures; a ſet of ſix landſcapes ornamented with buildings, figures, and animals, in the ſtyle of Poelenbourg; a ſet of four with ruins and figures, all of quarto dimenſions; three landſcapes with various animals, in quarto, nearly ſquare; "The Flight into Egypt," a paſtoral and poetic ſubject, of a ſhepherd and his flock entertained by a muſe; a ſhepherd and ſhepherdeſs taking refuge in a cave, from a violent ſtorm; another paſtoral ſubject, with a ſhepherd in the antique dreſs ſeated, ſurrounded by animals, all in large quarto; and a folio print of Hercules preventing Cacus from ſtealing his cows and horſes, the figures in which are in the antique ſtyle; theſe two laſt prints are very rare.

J. G. Blecker, or Bleker, was born at Haerlem ſome time about the year 1606. He engraved a conſiderable number of prints, both from his own compoſitions and thoſe of other maſters, in an intelligent and ſpirited ſtyle.

Blecker marked his plates in various ways, which has given riſe to miſtakes, for Heinneken calls him John Gaſpar, and Florent le comte, Cornelius; which has led our countryman Strutt into the error of making two artiſts of the name of Blecker, one of whom he calls Cornelius, and gives him the monogram, for which ſee our third plate of thoſe uſed by the artiſts of the Netherlands. The following are among the beſt of his works.

From his own Compoſitions.—A landſcape with the meeting of Jacob and Rachael; a landſcape, into which is introduced the meeting of Abraham's ſervant with Rebecca. He has, in this inſtance, worked upon the etching to harmonize it (eſpecially upon the heads of his figures) with the point of the graver, ſcratching upon the copper, in a ſtyle ſomething like that which Worlidge afterwards adopted; but he has by no means ſucceeded. "Two Peaſants travelling in a Cart;" another engraving of the ſame ſubject; "A Carriage ſtopping before an Inn door, with Horſes feeding;" "A Peaſant ſeated, obſerving a Girl, who is milking a Cow," all of folio ſize; a landſcape with animals; another landſcape, with a woman on horſeback, both in 4to.; and two others, in which animals and a piping ſhepherd are introduced, both in folio.

The following are after Poelenbourg.—"Jacob and Laban parting their Flocks;" "The Lyſtrians attempting to ſacrifice to Sts. Paul and Barnabas" both in large folio; and "Chriſt on the Croſs," at the foot of which appears the Virgin and diſciples, in folio, three very capital engravings.

The Viſſchers, whom we now approach, were a very diſtinguiſhed family of artiſts, and who, by the number and extraordinary merits of their engravings, have conferred much honour, and no ſmall advantage, on their country.

Cornelius Viſſcher was born in Holland, A.D. 1610, he was the diſciple of Soutman, but ſoon ſurpaſſed him in merit. M. Watelet truly ſays, (in his Dictionary of Engravers,) that very few artiſts combined etching and engraving with ſo much taſte, or ſo well imitated with the graver alone, all the playful pictureſqueneſs of the point, as Cornelius Viſſcher. He drew with great taſte, and the compoſitions which he made for many of his engravings, ſufficiently prove the extenſiveneſs of his genius, and his powers of combination. His etchings are free and delicate; but his works with the graver muſt excite the admiration of every taſteful beholder. His mode of performance with that inſtrument was as ſingular, as the effect he produced was pictureſque and beautiful. Among the engravings from his own compoſitions that of "The Rat-Catcher," "The Bohemian Woman," "Gellius de Bouma," and "The Cat," deſerve the preference; in the Bohemian, the rough freeneſs of the etching needle is finely contraſted with the ſhining ſmoothneſs of the lines produced with the graver. The portrait of Bouma is yet more exquiſite and ſurpriſing, his old and wrinkled ſkin being engraved in a manner which is peculiarly characteriſtic of the laxity and feebleneſs of the decaying muſcles and ſhrivelling integuments of old age, particularly about the cheeks and temples; the noſe (ſays Huber) appears like fleſh itſelf, and the mouth, which is partly concealed by the beard, ſeems to be alive, as do alſo the eyes, the execution of which is beautifully clear, and expreſſive of the dimmed brightneſs of a mind which time is eclipſing. The ſame nice feeling, accuracy of diſcrimination, and power over the inſtruments of his art, marks the execution of his celebrated Rat-catcher, in which the ſhining face as well as negro features and complexion of the young African, are admirably depicted, and the maſter rat-catcher with his furred cap, and highly characteriſtic habiliments, rat cage, &c. and, above all, his animated phyſiognomical countenance, which together mark the profoundeſt of adepts in the myſteries of his craft, are expreſſed with that broad and general, and therefore ſtrong, reſemblance to nature, which all eyes muſt have ſeen, and is finiſhed with the utmoſt vivacity of touch.

Cornelius was an engraver of truly original powers; he was a man of a ſelf-willed character of mind, and perhaps ſhould not have endeavoured to copy the feelings, and transfuſe the forms, which had originated in the minds of other artiſts. It is acknowledged that his engravings after the Italian painters, are of inferior merit to thoſe which are after nature and his own compoſitions; the plates which were executed for "the cabinet of Reynſt," are among his earlier performances, nor did he ſucceed ſo well as Vorſterman, Pontius, and the Bolſwerts, in engraving after Rubens; yet he claims to be ranked among the firſt artiſts of his country, for genius always ſhould be eſtimated, not by its freedom from defects, but by the dimenſion of its merits.

Among his beſt works, the collector may reckon the following; thoſe who would ſee a more copious catalogue, may conſult Baſſan's Dictionary of Engravers.

Portraits.—Cornelius Viſſcher, in a ſugar-loaf hat; another portrait of Viſſcher, with the ſame kind of hat, and a cloak, both in 4to.; Andrea Deonyſzoon, called among print dealers, "the man with the piſtol," becauſe a ſmall carbine or piſtol with ſeveral gun locks appears in the background; this print is one of the fineſt, and the moſt rare, of the engravings of this maſter, but perhaps the very ſcarceſt of all, and certainly the moſt intrinſically valuable of his portraits, is that of Gellius de Bouma, miniſter of Zutphen, aged ſeventy-ſeven years; William de Ryck, an oculiſt of Amſterdam: this portrait, and the preceding, are ſometimes called "The great Beards," and are uncommonly fine, all of folio ſize; a biſhop ſeated at a table, with a crucifix, &c. half length; John Merius, the paſtor of Spanbroeck, both in large folio; Cornelius Voſberg, the paſtor of Spaerwouw, in folio, a very fine and rare print; John Wachtelaer, an eccleſiaſtic of Utrecht, in large folio; William van-den Zande, theologiſt, in an oval border; Adrian

Motman, accompanied by cherubs, a ſkull, and a cenſer; John Boelenſz, in an oval border, with "Sanctitate et Doctrinâ" inſcribed on a ſtreamer; Adrian Pauw, knight of the order of St. Michael; David Peiterz de Vries, chief maſter of the artillery in the Dutch States, very rare; Joſhua Vondel, a Dutch poet, half length, all of folio ſize; Jacob Weſterbaen, lord of Brandwick, &c. half length, in an oval border, octavo ſize, very rare; Alexander VII. ſovereign pontiff, with the motto "Juſtitia et Veritate" on a cartouch ſupported by children; Coppenol, commonly called the writer, becauſe he holds a pen; Peter Scriverius, a philoſopher of Haerlem, (of this engraving it is uncommon to meet with a good impreſſion); John de Paeſs, holding a purſe, and a cartouch, on which is written his occupation of an exchange broker, all in folio; an etching of an old woman, commonly ſuppoſed to be the mother of Viſſcher; another portrait of the ſame perſon, with a bonnet on, both of quarto ſize; Robert Junius of Rotterdam, a clergyman, in an oval border, "Palmidas pinx." in folio; Conſtantine Huygens, nobleman of Zuylichem, father to the celebrated mathematician of that name, a fine and rare print; a buſt of Peter Gaſſendi, in an octagon border, with Latin verſes; both in 4to.; William of Naſſau, ſon of Frederic Henry, prince of Orange; Mary, eldeſt daughter of Charles I. wife of the former, both in large folio, from Hondthorſt; Chriſtiana, daughter of Guſtavus Adolphus, and queen of Sweden; Frederic William, elector of Brandenburg; Charles Louis, palatine of the Rhine, and elector of Bavaria; Charles II. of England, all after Hondthorſt; Janus Douza, lord of Northwick, and of ſome celebrity as a philoſopher, all of large folio dimenſions. And two very rare portraits, which we do not find ſpecified in the catalogue of Hecquet, *viz.* Francis William, biſhop of Oſnabruck; and Louis Cutz, theologian, both in ovals, of 4to. ſize.

Hiſtorical, &c. from his own Compoſitions.—"The Four Evangeliſts," half lengths, with attributes, in folio; "The Pancake Woman," a large folio plate, the beſt impreſſions of which are before the name of Clement de Jonghe was affixed to it; the ſecond beſt, before that of John Viſſcher. It was afterwards retouched by Baſſan, and the name of John Viſſcher eraſed; but the laſt impreſſions are eaſily diſtinguiſhed from the firſt by their palpable inferiority. "The Rat-Catcher," the firſt impreſſions of which were taken before the name of Clement de Jonghe was affixed to it; "The Bohemian or Gypſey Woman," with three children, to one of whom ſhe gives the breaſt, all in large folio; the name of Viſſcher, in the earlieſt impreſſions of the latter plate, is upon the margin at the bottom. It was afterwards obliterated to make room for the inſcription, and affixed to the upper part of the plate; "The Interior of a Cabaret," with a party of five men ſmoking and drinking, in folio; "The Antiquary," repreſenting an amateur in his cabinet, looking over his curioſities, in large folio. By ſome this is miſtakenly ſaid to be from a picture by Reynſt, and others attribute it to Correggio. Charles Guſtavus, king of Sweden, and his queen, accompanied by a great crowd of perſons, and an old man reading a paper; "The Coronation of the Queen of Sweden," inſcribed "Carolus Guſtavus:—Hedwig Eleonora;" all of large folio ſize; a boy holding a candle, and a girl with a mouſe trap, in which is a mouſe: this print is uſually called "The Mouſe Trap," in 4to. A figure lying on a tomb, above which Chriſt appears with cherubs, beneath is a bas-relief with two genii placing a ſerpent on a ſkull crowned with laurel; above is inſcribed "Fortiter, ſed ſuaviter," in large folio. A cat ſleeping, with a rat before her, in 4to; a cat ſleeping upon a napkin, a very ſmall plate lengthways. This print is exceedingly rare, and at the auction of Mariette's collection, it ſold for the ſum of three hundred and ſixty-one livres.

Hiſtorical, &c. after various Italian Maſters.—"The Angel commanding Abraham to quit his Country, and ſojourn in the Land towards which he points," from Baſſan; "Abraham at Sichem, and God appearing to him in a Dream," from the ſame painter; "Suſannah and the Elders," from Guido. The buſt of a woman with her hand upon her breaſt, a very fine print, thought to be from Parmegiano, all in folio; "Chriſt carried to the Tomb;" "The Reſurrection," after P. Veroneſe, inſcribed "Ego et Pater unus ſumus," in large folio; "The Holy Family," where the infant Chriſt is on the lap of the Virgin, and St. John preſents fruit; thought to be from Palma; "The Holy Family," in which the infant Chriſt is playing with flowers on the lap of his mother, and in the back-ground is Tobit brought by an angel; and another "Holy Family," where St. John preſents a pear to the infant Chriſt, both without the painters names, and all of folio dimenſions.

Subjects from Flemiſh Maſters.—"The Laſt Judgment," after Rubens, a fine engraving, on two large folio plates; "The Holy Virgin and Infant Chriſt ſurrounded by Angels," after the ſame painter, in large folio; "St. Francis d'Aſſiſe receiving the Infant Chriſt from the Virgin," in large folio; "Achilles diſcovered by Ulyſſes at the Court of Lycomedes," in large folio. At the time Viſſcher engraved this plate he was under the direction of Soutman. A boy lighting his candle from that of a woman with a baſket, in large quarto; all from Rubens. A man playing the violin, accompanied by five children, from Van Oſtade, a very fine engraving, of which it is very difficult to find a good impreſſion. An etching of the ſame ſubject, marked "A. Van Oſtade pinx. C. Viſſcher fecit. aqua forti." The interior of a ſmoking-room, with ſix men, a woman, and two children; all in large folio. The beſt impreſſions of this plate are before the names of Viſſcher and Oſtade were inſerted. A ſmoking-room, with two men and a woman drinking; a man and woman in a public houſe, on whoſe faces drunkenneſs and vulgarity are depicted moſt admirably; both from Oſtade. A party of five men in an alehouſe, one of whom plays the violin, whilſt the others ſing, from Ad. Brouwer, both in folio. A ſurgeon performing an operation on a man's foot, in folio; from the ſame maſter. Three very fine prints, after P. van Laer; *viz.* 1. The piſtol-ſhot, or the coach robbed; in folio. 2. An attack on a convoy. 3. The lime-kiln; both the laſt in large folio. A party of hunters on horſeback, with hounds, &c. from P. de Laer; and its companion, a man ſeated on the banks of a river, in which women are waſhing. A landſcape with a moonlight effect, which expoſes two robbers making off with their booty, after having knocked down a man; and its companion, a rural ſubject of a man and woman tending ſheep, both in large folio, from de Laer; and two ſets of four folio plates, each after Berghem, of which the ſubjects are landſcapes, adorned with ruins and ruſtic figures.

The merits of John Viſſcher, as an engraver of landſcape, cattle, and ruſtic figures, were not leſs original and extraordinary than thoſe of his brother Cornelius. He was born at Amſterdam in the year 1636, and has been ſpoken of as a painter as well as an engraver. His pictures we have not ſeen, and his engravings alone are ſufficient to entitle him to the fame he ſo juſtly enjoys.

With artiſt-like regard to the demands of the claſs of ſubjects which chiefly engaged his abilities, a much larger portion of his engravings is performed with the etching-point than in thoſe of Cornelius, which inſtrument he handled with the utmoſt freedom and pictureſque playfulneſs. Berghem, of whom we ſhall preſently ſpeak, and of whom we have treated in vol. iv. was a paſtoral painter, and no man to this hour has tranſlated the poetry of Berghem's painting, with more ſucceſs than John Viſſcher, unleſs Laurent, an Engliſh engraver, who died young at Paris, might be excepted.

Trees, eſpecially thoſe of thorny-charactered foliage, ſuch as Berghem painted; broken ground; the rough hides of cattle, in all their wild varieties; moſſy rocks, and the crumbling ſurfaces of ruined edifices, he treated with ſingular feeling and felicity, blending a painter's and almoſt a naturaliſt's knowledge of the details of the forms of ſuch objects, with an engraver's taſte and manual power of execution. Shallow brooks, in which, diſturbed by fording cattle, the ſunſhine glitters, as long as prints can be preſerved, will continue to ſparkle with the merits of Viſſcher, while his deeper ſtreams and lakes reflect the meridian glow of his reputation.

Middiman, as well as many other modern engravers, appear to have formed their ſtyles of etching graſſy ground, and rocks patched with lichens, from contemplating the prints of this maſter, and no man better than he imparted truth of character and animal expreſſion to cows, horſes, aſſes, goats, ſheep, and all the various tribes of domeſtic animals which his great maſter Berghem delighted to paint, and therefore painted ſo well; or diſplayed on paper with a readier hand the ruſticities of Oſtade.

The portraits of John Viſſcher, with which we ſhall commence our liſt of his ſuperior performances, ſhew that he occaſionally handled the graver with ſcarcely leſs freedom and taſte than the etching-needle.

Portraits.—John de Vitenbogaert, from a drawing by Viſſcher himſelf, in quarto; Peter Proclius, a miniſter of Amſterdam, after Van Noort; Thadeus Lautman, paſtor of La Haye, after J. de Bane, both in folio; Abraham vonder Hulſt, vice-admiral of Holland, in large folio; Petrus Paulus Rubens, an etching from Vandyke; Michael de Ruyter, admiral of Holland, H. Berckmans pinx.; both in folio; a man with his hair dreſſed, after C. Viſſcher, in quarto; and a negro ſhooting an arrow from a bow, after the ſame maſter, in folio.

After Oſtade.—A company of peaſants under a trellis-work, gaming; “Ruſtic Economy,” where a man is winding off cotton, and his wife ſpinning it; “A ruſtic Party,” compoſed of two ſmokers, and an old woman and child; “Peaſants rejoicing;” “A Skirmiſh before the Door of a Tavern;” “A Peaſant's Wedding,” inſide of an alehouſe; and a drunken peaſant putting his hand on the boſom of a woman, all of folio dimenſions.

After Berghem.—Several peaſants dancing in a cottage, commonly called “The Ball,” in large folio; a beautiful landſcape, ornamented with figures and animals, and its companion, a mountainous landſcape, with a man and horſe travelling; “Summer,” in large folio; a landſcape, with a man clad in goat's-ſkin, on horſeback, in folio; and its companion, a girl milking a goat, in a landſcape; a pair of paſtoral ſubjects, in one of which is a ſhepherd meditating, in the other a woman milking a goat, and a piping ſhepherd. The four parts of the day, Aurora, Meridies, Veſper, and Nox, beautiful landſcapes, in large folio. A ſet of four large folio etchings of landſcapes, in which the figures introduced are; 1. A man on a mule. 2. A woman. 3. A ſhepherd guiding his flock. And 4. A mule loaded with pea-hens. A ſet of ſix landſcapes; 1. Men ſhoeing an aſs. 2. Two women and a dog, one of whom is carrying a ſack. 3. A ſhepherd on an aſs, driving his ſheep. 4. A woman carrying faggots, and a peaſant on horſeback. 5. A peaſant on an aſs leading a cow. 6. An old man with a beard, ſitting againſt a wall, in folio. A ſet of four, the title-page of which is a monument or tomb. 2. A ſhepherd playing the bag-pipes. 3. A ſhepherd and his dog fording a brook. And, 4. A boy carrying faggots; in folio. Another ſet of landſcapes, of which the title-page is a fountain or watering-place for cattle, with a woman milking a goat. 2. A ſhepherd wrapped in his cloak, with a ſtick. 3. A ſhepherd ſeated on a hillock, and another in paſtoral converſation. 4. A woman on an aſs, and a girl ſtanding beſide her; all in folio. Four other ſets, of various numbers, of landſcapes, with ſimilar ruſtic figures introduced; all of folio dimenſions. And the ornamental decorations of various geographical charts, for which Berghem ſupplied the deſigns.

From other painters of cottage ſcenery, he engraved a ſet of eight prints of figures and animals, after H. du Jardin; a ſet of four large folio prints, after P. de Laer, which have been attributed by ſome to Cornelius Viſſcher, though with better foundation, by others to John. They conſiſt of 1. A party of beggars playing at cards, ſurrounded by a crowd of ſpectators. 2. A woman on horſeback guiding cows, near whom is a man who has diſmounted to drink out of his hat. 3. An hoſtler buſied at an inn-door; near which is a ſtable with horſes feeding. 4. A forge, with a man ſhoeing a horſe, and others converſing.

After P. Wouvermans.—A victualling tent, and horſemen ſtopping to drink; another victualling-tent, with men carouſing; horſemen diverting themſelves before their tents, and, as uſual in the compoſitions of Wouvermans, a white horſe with trappings; all in large folio. A ſet of four in folio, of 1. The marſhalling of an army, with a horſe on the fore-ground. 2. A victualling tent. 3. A party of travellers. 4. A riding-ſchool.

A ſet of twelve after G. van Goyen, of landſcapes and ſea-pieces, enriched with various buildings and figures, in quarto; and another ſet of twelve wild landſcapes, and marine ſubjects in Italy, after Herman Swaneveldt, which are very intereſting, and adorned with figures; muſt conclude our liſt of the works of this meritorious artiſt.

Lambert Viſſcher, the brother of Cornelius and John, was born at Amſterdam in the year 1634, and died at Rome, whither he had travelled for improvement or employ, and where he engraved in conjunction with Bloemaert, Spierre, and others, from the pictures of Pietro da Cortona, in the palace of Pitti, at Florence. He engraved both portrait and hiſtory, working with the graver alone, but did not poſſeſs any very great ſhare of merit. The following are a ſelection of the beſt of his productions.

Portraits.—Staniſlaus Lubienitz, M. Scheitz pinx.; John Rutgerſius, counſellor of Guſtavus Adolphus, both of quarto ſize; Chriſtopher de Kannenberg, privy counſellor to the elector Frederic William of Brandenburg; Maria Thereſa of Auſtria, queen of France, from Van Loo; all in folio. Charles Rabenhaupt, baron of Sucha, and lieutenant-general of Holland; John de Wit, the diſtinguiſhed penſionary and patriot of Holland; and Cornelius Tromp, vice-admiral of Holland, F. Bol pinx.; all of large folio dimenſions.

Hiſtorical, &c.—“The Generoſity of Seleucus to Antiochus,” from P. da Cortona; and “Virtue delivering a young Man from the Embraces of Voluptuouſneſs,” in large folio, from the ſame painter.

Nicholas John Viſſcher was of the ſame family as the preceding artiſts, and born at Amſterdam ſome time about the year 1580. We have by him a conſiderable number of etchings, executed in a free agreeable ſtyle; he particularly ſucceeded in ſmall landſcapes, with figures and animals. He likewiſe engraved a few portraits, which he marked with his name at length, or ſometimes with a monogram, compoſed of C. and V. for Claus or Claas, being the Dutch abbreviation of Nicholas, and which will be found in *Plate* III. of thoſe uſed by the engravers of the Low Countries.

The following of his engravings are moſt worthy the attention of the collector. William Laud, Archbiſhop of Canterbury; Charles I. of England, in a large round hat, both in 4to.; John Calvin, in folio; Didier Eraſmus of Rotterdam, from Hans Holbein; James II. of England, and James, duke of Monmouth and Buccleugh, both in large folio.

Etchings.—"The Table of Cebes," an allegorical ſubject on human life, in large folio; "The Execution of the State Criminals, of the Sect of Arminians, at the Hague," in folio; two landſcapes with Dutch caſtles, in large folio; and a view of the caſtle and environs of Lovenſteyn, which was uſed as a priſon. At the bottom of the print is a perſpective view of the caſtle in the form of a frieze; and on each ſide a medallion. This is a folio print, very rare, and beautifully executed.

Peter Nolpe was born at the Hague, A. D. 1601. The circumſtances of his life are rather obſcure, but his works prove him to have been a man of talent. He is ſpoken of as a painter; but apparently his engravings are far more numerous than his pictures. He worked with the point and graver, and generally united them; but ſome of his plates are executed with the graver only, which inſtrument he handled with much more facility than taſte. He engraved portrait, hiſtory, and landſcape, but excelled moſt in the latter, for he was but imperfectly maſter of the human form, whereas his landſcapes poſſeſs a certain air of boldneſs and freedom, which manifeſt a practiſed hand, though not a mind of profound information.

The moſt valuable of his works are the portraits of John Adler Salvius, a miniſter plenipotentiary to the court of Sweden, in 4to. A ſet of eight horſemen, in 8vo.; very rare etchings. A ſet of eighteen etchings of beggars, in 4to. after Quaſt, of whom we ſhall ſpeak anon, and treated in his manner. "The Angel delivering St. Peter from Priſon," after J. V. Vucht, in folio; "Judah and Tamar," in a landſcape of large folio ſize. The ſame figures he afterwards introduced into a landſcape of a much ſmaller ſcale. "An Inundation," occaſioned by the burſting of a water-bank. This is a very ſcarce print, executed with much force. "Daniel in the Lion's Den," after Blanchard; "The Voyage of his Majeſty, the King of Great Britain, to the Coaſts of Holland." An emblematical print on the marriage of the prince of Orange, with the princeſs Mary of England. A ſet of ſix landſcapes, after Van Nieulant. Six ditto, which are eſteemed beautiful, after Rogman, all in folio. The remainder are of larger folio dimenſions. A view of the guard-houſe at Amſtel, near Amſterdam; eight of the months of the year, which are very beautiful, with fine effects. A ſet of the four ſeaſons; another of the four elements, from Peter Potter; "The Prophet Elias, with the Widow of Sarepta;" "St. Paul the Hermit fed in the Wilderneſs by an Eagle," both in large folio; and a very capital print, engraved on five plates, after C. Molyn the younger, of "The Cavalcade made by the Citizens of Amſterdam, on the Entrance of Mary of Medicis;" ſome of which he marked with a monogram which is copied in *Plate* III. of thoſe uſed by the artiſts of the Netherlands.

Peter Quaſt. There is a certain fanciful quaintneſs about this artiſt, of a diverting kind. The groteſque quirks of his morrice-dancing beggars are perfectly homogeneous with the twirling Q's in his various monograms, and makes us anticipate ſomething entertaining in the hiſtory of his private life, of which alas! we know nothing, but that he was born at the Hague in the year 1602, and was the intimate friend of Nolpe, whom we have juſt diſmiſſed.

He deſigned and engraved groups of peaſants, battles, beggars, and barbers' ſhops, and even in his battles there is ſomething allied to drollery. His talents, in many reſpects, were but little inferior to thoſe of Callot, with whom he was contemporary, and to whom, in the management of his tools and ſtyle of engraving, he bore a remarkable reſemblance.

The monograms of Quaſt may be ſeen in *Plate* III. of thoſe of the engravers of the Netherlands, and his principal works, are, "Fyf ſinnen te Koop," (or the five ſenſes) in octavo, dated 1638; the four ſeaſons, perſonified by groteſque figures, in quarto. A ſet of twelve plates of Capriccio and groteſque figures, in 8vo. Another ſet of Capriccio, of which the ſubjects are beggars, old women, and oddities, ſuperſcribed on the title page "Tis all vervart Gaeren:" this ſet conſiſts of twenty-ſix plates in 4to. Another ſet of ten quarto plates of beggars, with quizzical names and correſponding landſcape back-grounds; and a ſet of twelve plates in 4to. of whimſical modes and faſhions, in the taſte of the nobleſſe of Callot.

Francis Vander Steen was born at Antwerp, A. D. 1604, and having in his youth loſt the uſe of one of his legs by an accident, his parents thought of fine art as a profitable or pleaſant occupation; and if a correct judgment may be formed by his ſucceſs, moſt probably the former; for he obtained high patronage, though he poſſeſſed not much merit. The archduke Leopold aſſigned him a penſion, which was continued by Ferdinand III.

His engravings, however, of which the following are the chief, find their way into the port-folios of thoſe who collect the productions of this ſchool, either on account of their ſubjects or ſuppoſed merits.

Portraits.—Cornelius Cort, in 8vo.; Theodore Coornhaert, in 4to., both celebrated engravers; Andrea del Vaulx, or Vallenſis, profeſſor at the academy of Louvain, in 4to.; and George Sebaſtian Lubomirſki, count of Wiſniez, Herdt. del; in folio.

Hiſtorical, &c. after various Maſters.—"The Holy Family," where the infant John preſents flowers to Chriſt, from Titian; "The Holy Family," with St. Joſeph ſeated on a ſack. This ſubject is called in Italy "La Madonna del Sacco," from Andrea del Sarto, and has ſince been engraved by Bartolozzi and by Raphael Morghen. "The Dream of Michael Angelo," from Michael Angelo; "Soldiers playing at Cards," from Manfredi, all in folio; "A Man holding a Flaggon and a Cup, in company with another Man," in 4to.; "A Peaſant ſeated, reading the Newſpaper, whilſt an old Woman careſſes him with one Hand and holds a Pot of Beer in the other;" "A Village Party," of quarto ſize; "The Miſer and his Wife counting their Gold," in folio, all after Teniers; "A drunken Silenus ſupported by Satyrs and Bacchanals," from Vandyke; "A Cupid forming a Bow from the Club of Hercules," after Correggio, in folio. At the bottom of the print are two children, one of whom cries and the other laughs. "Jupiter and Io;" "The Rape of Ganymede." Theſe three engravings are very rare, from the pictures of Correggio in the gallery of Vienna, and at the ſale of Mariette's collection were ſold for two hundred and fifty livres. "The Martyrdom of eleven thouſand Virgins," engraved on four plates from the drawings of Van Hoy, after the original pictures by Albert Durer; "St. Pepin and St. Begue," half-length figures on the ſame plate, from drawings by Rubens, after the pictures by Van Eyck; and the portico of the picture gallery at Bruſſels, commonly called “The Gallery of Teniers,” from Van Hoy, all of folio ſize.

Hans or John Witdoeck, Withouc, or Witdouck, was born at Antwerp, A. D. 1604. He was among the number of artiſts who enjoyed the friendſhip and inſtructions of Rubens, and ſeems to have entirely devoted himſelf to engraving the pictures of that great maſter. Witdoeck did not well underſtand the human figure, for the naked parts are but indifferently expreſſed, the extremities are heavy, and the markings of the joints are not properly determined. Neither is the mechanical part of his engraving leſs exceptionable. It proves that he had very little command of the graver, or did not ſufficiently ſtudy that part of the art to produce a clear and agreeable effect. Notwithſtanding theſe faults, Baſſan has praiſed him, and the prints which he executed under the eye of Rubens in chiaroſcuro, poſſeſs a tolerable effect.

The following engravings from the hand of this maſter, are thoſe which are moſt worthy the notice of the collector. A pair of buſts of “Cicero” and “Demoſthenes,” in folio; “Melchizedeck preſenting Bread and Wine to Abraham and his Followers;” “A Nativity,” both in large folio, from Rubens. This latter plate underwent ſeveral alterations, chiefly to add to the effect. The firſt impreſſions are without the addreſs of Corn. Coeberch, the ſecond have the addreſs; after which the plate came into the hands of S. Bolſwert, who engraved on, and improved it very much. He effaced the name of Coeberch, and inſerted his own. “The Adoration of the Kings,” in large folio, from Rubens. This print likewiſe underwent ſeveral alterations in the effect. “The Elevation of the Croſs,” a large print lengthways, from Rubens, on three plates; “Chriſt at Table with his two Diſciples at Emmaus,” a large folio plate, nearly ſquare. There are ſome few impreſſions of this plate, with the addition of a tint from a wooden block; but theſe are very rare. “The Aſſumption of the Virgin,” a very fine and rare print, in large folio, of which thoſe impreſſions that are marked C. Van Mulen are retouched. “The Virgin and Infant Chriſt,” in an oval border; “The Holy Family,” where the Virgin is repreſented ſuckling the Infant Jeſus. The beſt impreſſions of this engraving have the addreſs of Moermans. Another “Holy Family,” here the Holy Infant is repreſented aſleep on the boſom of his mother, all of folio ſize; “St. Ildefonſe receiving a Chaſuble from the Holy Virgin,” a very fine and rare print, in large folio; “The beheading of St. Juſtus;” and “St. Cecilia,” both in large folio, and all after Rubens.

After Cornelius Schut.—“Judith and Holofernes;” “The Holy Family;” “The Virgin on a Creſcent;” “The Virgin ſeated in a Landſcape, ſurrounded by Angels;” “The Virgin and Chriſt, accompanied by St. John and Angels,” all in folio; and “St. Nicholas appearing to the Emperor Conſtantine, and delivering three Tribunes from Priſon,” in large folio.

Remoldus, or Rombaut Eynhouedts, was born at Antwerp in the year 1605, in which city he always reſided. His plates are executed with a firm dark point, and in a ſtyle which he had the art of varying and adapting to thoſe of the ſeveral painters after whom he engraved. His drawing, though not always equally correct, is very ſpirited, and his maſſes of light and ſhade very well preſerved. His principal engravings are after Rubens and Schut, but he likewiſe engraved ſome ſubjects for “The Cabinet of Teniers.”

We ſhall ſpecify the following from the hand of this artiſt: “A dead Chriſt,” after Palma the younger; “Chriſt riſing from the Tomb,” after the elder Palma; “The Adoration of the Kings,” after Rubens, very rare; “The Reſurrection of Chriſt,” from the ſame painter; “The Fathers of the Church,” and “St. Clare holding the Holy Sacrament;” all of folio ſize. “The Virgin ſeated, ſurrounded by Saints;” “The Chapel where Rubens was entombed,” in 4to.; “St. Gregory, between Prudence and Courage, leaning on a Staff;” above is a picture of the Virgin and Chriſt, and angels holding wreaths of fruit, after Rubens, in large folio. “St. Chriſtopher,” in folio, after the ſame painter; “St. Peter” and “St. Paul,” in folio; “Cambyſes, King of Perſia,” who having ordered an evil judge to be flayed alive, cauſed his ſkin to be ſpread upon the ſeat of juſtice, and placed the ſon of the culprit upon it, making him judge in his father's ſtead; a ſmall ſquare plate. “Peace and Happineſs,” Peace is crowned by Victory, and is ſupported by Power and Juſtice, accompanied by other allegorical figures, all after Rubens; “St. Ann,” in folio; “The Aſſumption of the Virgin;” and “The Martyrdom of St. George;” both in large folio, after Schut.

Peter Clouet, Clowet, or Clouvet, was born at Antwerp, A.D. 1606; he learned the elements of art in his native country, and afterwards went to Italy for improvement, where he ſtudied under Spierre and Bloemaert. He returned by way of Paris, where he remained and exerciſed his profeſſion for ſome time, but finally ſettled at Antwerp.

He worked entirely with the graver in a clear firm ſtyle, not a little reſembling that of P. Pontius. His prints are generally deficient in middle tints, and therefore in harmony, and though full of colour, and boldly engraven, from too equal a diſtribution of the ſhadows, and the lights being too much ſcattered, they loſe a great part of their effect. However, his prints, eſpecially thoſe after Rubens, are much ſought after. He exerciſed his art both on portraits and hiſtory; and the following is a ſelection of his moſt meritorious engravings:

Portraits.—Peter Aretin; Nicolas Coſſin; Thomas à Kempis; Ferdinand Cortez; Amerigo Veſpucci; and Francis de Malherbe; all of quarto ſize, and without the names of the painters. Michael Boudwyns, a phyſician of Antwerp; William Cavendiſh, duke of Newcaſtle, on horſeback, both in folio, from Diepenbeck; Chriſtopher Vander Lamen, a painter of Antwerp; Theodore Rogiers, a goldſmith of Antwerp; Charles Scribanius, a Jeſuit of Antwerp; Ann Wacke, holding a plume of feathers; and Henry Rich, count of Holland; all after Vandyke, in folio.

Hiſtorical, &c. after various Maſters.—“The Deſcent from the Croſs,” from Rubens, in large folio; “The Epitaph of Rubens,” in folio; “The Death of St. Antony,” a fine and rare print, in large folio; “St. Michael vanquiſhing the Devil,” in folio; “A Converſation between ſeveral Lovers in a Garden:” the beſt impreſſions have Flemiſh verſes beneath, but thoſe with French are likewiſe much ſought after. This converſation piece is a very fine and rare print, in large folio. A ſtanding female figure, in folio; a winterſcape, with a cottage, and the ſnow falling, belonging to a ſet of ſix, the other five of which were engraved by S. Bolſwert, all after Rubens. “The Virgin ſuckling the Infant Chriſt,” after Vandyke, in large folio; and “A Party at Table,” where the maſter and miſtreſs are crowned with laurel; “The Family of the Duke of Newcaſte,” after Diepenbeck, in folio.

Albert Clowet, or Clouet, was born at Antwerp in the year 1624. He was nephew to the preceding artiſt, and went to Italy to ſtudy under C. Bloemaert. During his reſidence at Rome he engraved a conſiderable number of plates, and among them ſeveral of the portraits for the Lives of the Painters, by Bellori, which were printed in that city, A.D. 1672. He always worked with the graver in a neat ſtyle, imitating, in his hiſtorical works, with tolerable ſucceſs, that of C. Bloemaert. His portraits are ſometimes in the ſtyle of Mellan, at others in that of F. de Poilly, and ſometimes in that of Nanteuil; though by no means equal in merit to the works of thoſe great maſters, either in drawing, effect, or mechanical execution.

Among various other *Portraits*, he has executed a collection entitled "Effigies Cardinal. nunc viventium," which were publiſhed at Rome by J. Roſſi. The following are likewiſe by him.

Nicolas Pouſſin; Antony Vandyke; the cardinal Azzolinus, from Vouet; cardinal Jacob Roſpiglioſi, from J. M. Morandi; cardinal Charles Roſetti; cardinal Francis William de Wartenberg; Maximilian, count of Wolfegg; and the medallion of pope Alexander VII. ſupported by the cardinal virtues; all of quarto dimenſions.

Hiſtorical, &c.—"St. John de la Croix," the firſt inſtitutor of the order of Carmelites; Lazaro Baldi, pinx. in large folio; "The Statue of the Happy Umiliana," after a drawing by Baldinucci; "The Sepulchral Monument of Pope Paul III." from Dom. Barriere, both in folio; "The Obeliſk placed on an Elephant, erected on the Place of Minerva," after G. L. Bernini, in large folio; "The Myſterious Conception of the Virgin," after P. Cortona, engraved on two plates, very fine and rare; "A Combat of Horſe-Soldiery," after Jac. Courtois; and a large print, engraven on four plates, of "The Battle of Joſhua," after William Courtois, brother to the preceding artiſt.

A much more extraordinary artiſt is now to be introduced to the reader's notice. Of wild, vigorous, and original powers, both as painter and engraver, Paul Rembrandt Gerretz, or Van Rhyn, gave a new impetus to art, and effected a revolution in taſte, of which the effects will long continue to be felt.

The profeſſor Fuſeli, by a grand metaphor, which ſpeaks whole pages in praiſe of the talents, powers, and influence of our artiſt, ſays, that the frantic pilgrimage of painters to Italy ceaſed at the apparition of the two meteors of art, Peter Paul Rubens and Rembrandt Van Rhyn. Both Fuſeli and the profeſſor Opie (who was too ſoon, alas! loſt to his country) have juſtly eſtimated and deſervedly praiſed the merits of Rembrandt as a *painter*, and they will doubtleſs be not leſs faithfully reported in this work, when the writer, to whoſe pen is confided our biography of painters, ſhall arrive at his name. In this place he will be treated as an engraver; yet if the preſent writer ſhould any where be thought to trench on the province of painting, let it be recollected, that of two arts ſo intimately connected as painting and engraving, and which call forth and exerciſe the ſame energies of mind, how difficult, how almoſt impoſſible it is, to write ſeparately and to write well.

Rembrandt was the ſon of Herman Gerretz, a miller of the neighbourhood of Leyden, and was born A.D. 1606, in his father's mill, which ſtood on the banks of the Rhine, between the villages of Leyerdorp and Koukerk. A ſpot which became intereſting from being the birth-place of ſo great an artiſt as Rembrandt, became doubly intereſting when brought to our view by the magic of his pencil. A picture of this mill, which was once in the Choiſeuil Collection, is now in the gallery of William Smith, eſq. M.P. for Norwich. It repreſents a very early hour of morning, and perhaps the figures which are introduced may have other local alluſions, of which the meaning is now loſt, to the time and circumſtance of his birth.

Finding that he poſſeſſed an enquiring and capacious mind, Herman ſent young Rembrandt to the college at Leyden, where his reigning paſſion for fine art, and his diſinclination for all other ſtudies, were ſoon manifeſt. Other maſters were accordingly provided to inſtruct him in the elementary principles of art; and Rembrandt ſtudied ſucceſſively under Van Scootens, Peter Laſtmann (an engraver of whom we have already treated), James Penas, and James Van Zwanenbourg.

How a man of ſo great genius came to ſeek inſtruction from ſo many maſters, it were difficult to ſay, and ſtill more difficult to think that they did not encumber his progreſs; but, perhaps, to the variety of their advice, we may in part owe the originality of Rembrandt. He did not, probably, remain long enough under the direction of any one of them, to trammel his habits, or overwhelm or ſtultify thoſe feelings and perceptions of nature, which are the genuine and free inlets to lofty and original attainments in art.

Hence Rembrandt has been compared to Shakeſpeare; and hence, like another wild poet whom "*Leyden* aids no more, with many-languaged lore," and who voluntarily

"——— leaves the lofty Latian ſtrain,
Her ſtately proſe, her verſe's charms,
To hear the claſh of ruſty arms;"

he allowed that the ancients were "pretty fellows in their day," but would point with ſarcaſtic air to the walls of his ſtudy, which were hung round with ſuits of armour, rich ſtuffs, and the pictureſque dreſſes of various ages and nations, and ſay "theſe are *my* antiques."

Both Rembrandt and his wife have been accuſed of an over-weening fondneſs for money. She ſold his engravings that he might not be interrupted in his profeſſional purſuits; and underſtanding the "tricks" of printſellers, was too much of a "traveller" to allow herſelf to be impoſed upon by them. It is ſaid that a conſiderable fortune was thus acquired, which devolved to an only ſon, Titus, to whom nature was as niggardly in her gifts, as ſhe had been prodigal to the father. The mean propenſities of Titus have been mentioned, and his inability to avail himſelf of his father's inſtructions in art; but the amount of his fortune has never been ſtated, and has probably, by unreflecting readers, been much over-eſtimated.

One of the moſt valuable paragraphs in Strutt's Dictionary of Engravers, is that which he has written on the prints of Rembrandt; becauſe while it deſcribes their merits with the fellow feeling of an engraver, it marks the difference, which cannot be too ſtrongly marked, or too often repeated in the public ear, between mere rarity and intrinſic worth; the want of which diſcrimination, more, perhaps, than any other cauſe, has been the bane of engraving; retarding its progreſs, by keeping us too intent upon nominal and extrinſic value, and too regardleſs of thoſe intrinſic qualities, which, as men of taſte, ſhould alone engage our attention.

He ſays, "His prints, which are partly etchings, and partly engravings, performed with the graver in a ſingular manner, have all that freedom of touch, ſpirit, and greatneſs of effect, diſcoverable in his paintings, ſuppoſing them to be aſſiſted by the variety of colours. Conſidering the great quantity of etchings he made, we cannot ſuppoſe they ſhould be all equally well executed, or equal in value. However, (according to the common courſe of things, on which an imaginary value may be raiſed by accidental cauſes,) they are not always his beſt prints which produce the greateſt prices; but thoſe that are the ſcarceſt. Thus we frequently ſee a print of great intrinſic worth in itſelf, if conſidered as a beautiful ſpecimen of the abilities of an artiſt, thrown aſide for no other fault than that of being too eaſily obtained; whilſt another, which perhaps is rather a diſgrace than an honour to him, is purchaſed at an extravagant price, and anxiouſly preſerved becauſe it is unique. It is merely owing to this caprice, that ſo many trifling alterations in the prints of Rembrandt, rather than a proper examination of their real merit, increaſe or diminiſh the worth of the ſame print. I myſelf, commiſſioned by an eminent collector, gave ſix-and-forty guineas for the great Coppenol, with the white back-ground, that is, before it was finiſhed; when, the ſame evening, at the ſame ſale, I bought a moſt beautiful impreſſion of the ſame print finiſhed, diſtinguiſhed by having a black back-ground, &c. which had an addreſs to Rembrandt at the bottom, written by Coppenol himſelf (for he was a writing-maſter of Amſterdam, and this print is his portrait,) for fourteen guineas and a half. In the ſecond inſtance, I exceeded my commiſſion by the half guinea; in the firſt, I did not reach it by nearly twice ten guineas. It cannot be reaſonably ſuppoſed, that ſuch a difference could exiſt between two good impreſſions of the ſame plate; and, ſpeaking as an artiſt, I ſhould certainly have taken the laſt in preference to the firſt."

The "ſingular" manner of which Strutt ſpeaks, appears to have been ſhrewdly gueſſed at by Watelet and Bartſch, who ſay, that "it would be difficult to diſcover the way in which Rembrandt worked: he certainly made great uſe of the dry point, which he ſometimes ſcraped but ſlightly, and the burr partially ſtopping up, or blending with the lines, reſembled a waſh," yet poſſeſſed more warmth and richneſs. The dry point which Rembrandt uſed was either, as Strutt has ſuppoſed, the point of a graver, or it was ſuch a dry point, as has ſince, in our own country, been much uſed by Worlidge, namely, cylindrical ſteel wire, whetted to a triangular point.

But the great wonder of his art, as an engraver, is his chiaroſcuro. He ſeems to have been born to ſhew us how much intereſt could be excited in a print without drawing, or any attempt at rendering local colour in the abſtract, by mere dint of compoſition and chiaroſcuro, and chiefly of the latter. Or, more ſtrictly ſpeaking, to ſhew us with how little drawing, and how entirely without the refinement of ſelection, in regard to forms, a powerful chiaroſcuro may be kept together, and brought to operate on our imagination and judgment.

In the diſpoſition of his lines, he ſeems to have been guided by no principle, but the ſpontaneous feeling of the moment; yet a certain tact of mind always attended him, and imparted ſtyle to his works.

It was probably from this ſpontaneouſneſs of feeling, which in his prints ſtands inſtead of ſtudy, that we ſee ſo many variations in ſome of his plates; which appear to have been ſuddenly thought of, and promptly executed from time to time, juſt as his muſe inſpired. At leaſt, this is a more artiſt-like, as well as natural ſuppoſition, than that his own avarice, or that of his wife, prompted theſe alterations (which have become ſo great objects of connoiſſeurſhip) with the ſole view of obtaining the money which the additional ſale produced. What man who maintains the contrary opinion, has proved that Rembrandt altered his plates for the worſe? Yet this is abſolutely neceſſary to the ſupport of the mercenary ſide of the argument.

The genius of Rembrandt was univerſal, and whatever the ſubject of his engravings, whether hiſtory, landſcape, or portrait, all are marked by the ſame energetic truth; the ſame wild graces; the ſame forceful chiaroſcuro. He painted and engraved what he ſaw, and did not attempt to generaliſe his objects by any proceſs of abſtraction, or accommodate or qualify them, by what he might ſuppoſe others had imagined. The learned precepts of his predeceſſors, ſuch as that art ſhould render men as they ought to be, not as they are, were diſregarded or deſpiſed by Rembrandt, and ſo ſtrong is the internal evidence of his works, or ſo perſuaſive his powers, that no ſpectator can entertain a doubt that his portraits, whether of perſons or places, are tranſcripts of Nature, executed under a firm conviction that where ſhe was pictureſque, according to his view of the capabilities of art, ſhe was as ſhe ought to be.

The prints of this maſter are dated from the year 1628 to 1659: their number, when added to that of his pictures, is ſurpriſing, and atteſts at once his profeſſional diligence, and the rapidity of his powers. Mariette poſſeſſed three hundred and ſeventy-five ſubjects: Yever, of Amſterdam, and Gerſaint of Paris, in a deſcriptive catalogue which he formed, have enumerated more, and Mr. Daulby, of Liverpool, as the preſent writer has been informed, more ſtill: ſo that their preciſe number is probably not known. It is ſcarcely neceſſary to add that no engravings, in their rare ſtages, or fine impreſſions, have been ſought after with more avidity.

Of himſelf, Rembrandt has engraved no fewer than twenty-ſeven portraits, to diſtinguiſh which from each other, by means of words alone, might not be eaſy. One holds a pencil, and is more carefully finiſhed than the reſt: another is in a ſort of Perſian habit, with an oval border; in another, his wife alſo is introduced, and moſt of them are of quarto dimenſions.

From the reſt of his works, the following may be ſelected with advantage.

Subjects from the Old Teſtament.—"Adam and Eve in the terreſtrial Paradiſe," rare; "Abraham ſending away Hagar and Iſhmael;" "Abraham and Iſaac," arched at the top, all in quarto; "Joſeph recounting his Dreams to his Father, in the Preſence of his Brethren;" "Jacob mourning for the Loſs of Joſeph;" "Joſeph ſolicited by the Wife of Potiphar," in octavo; "Mordecai conducted in Triumph by Haman;" and "The Angel Raphael diſappearing before Tobit and his Family," both in large quarto.

Subjects from the New Teſtament.—"The Annunciation of the Shepherds," with a very myſterious ſentiment and powerful chiaroſcuro, in folio; "The Adoration of the Shepherds," in large quarto; "The Circumciſion of Chriſt," with an extraordinary good effect; "The Preſentation in the Temple;" "The Flight into Egypt," both in 12mo.; another "Flight into Egypt," executed in his more ſcratchy ſtyle, in quarto; another "Flight into Egypt," in the ſtyle of Elſhiemer, in folio, a very much eſteemed print; "The Holy Family," where the Virgin is repreſented ſeated in an eaſy chair, and ſhe and the Infant appear aſleep; "Jeſus preaching to the Multitude," all in quarto; "Cæſar's Tribute Money," in 12mo.; "Chriſt turning the Money-Changers out of the Temple;" "Chriſt and the Woman of Samaria," a circular print; another of "Chriſt and the Woman of Samaria," in quarto, a very fine brilliant-toned engraving; "The Reſurrection of Lazarus," a circular print, with a powerful effect, in large folio; "The Reſurrection of Lazarus," a ſmaller print than the former; "Chriſt healing the Sick," a famous print, known by the name of "The hundred Florins;" an "Ecce Homo," a very grand compoſition, and a very capital engraving; "Chriſt taken from the Croſs," attended by the Magdalen and the Holy Virgin, (a companion

companion to the former print;) “Jeſus Chriſt preſented to the People by the High Prieſt;” and its companion, “The Crucifixion of our Saviour,” all of large folio ſize; (there are many impreſſions of this engraving, with various alterations:) “The Entombing of Chriſt,” in quarto; “Chriſt with his two Diſciples at Emmaus,” in folio; engraved with broader ſtrokes than is common in his prints; “The Good Samaritan arriving at the Inn with the wounded Man;” a very fine engraving, in folio, “Saints Peter and John healing the paralytic Man;” “St. Philip baptiſing the Eunuch of Queen Candace;” and “The Death of the Virgin,” a very fine forcible engraving, both of folio ſize.

Pious Subjects.—“St. Stephen ſtoned;” “St. Jerome,” engraved when Rembrandt was in his meridian; “St. Jerome at Devotion,” all in octavo; “St. Jerome writing,” with ſpectacles on, in quarto; “St. Jerome,” an unfiniſhed plate, the compoſition of which is rich, and the finiſhed part admirable; “St. Francis at Devotion:” great part of this plate is unfiniſhed, and the prints are very rare.

Hiſtorical and Allegorical Subjects.—“The Hour of Death,” an allegory on the vanities of the world; “Youth ſurpriſed by the Arrival of Death,” repreſented by a young man and girl walking together, and a figure of death ſtarting on them; “Medea, or the Marriage of Jaſon and Creuſa,” repreſenting the interior of a temple and the ſtatue of Juno, a very careful engraving, in folio; “The Star of the Kings,” a ceremony uſed in Holland on certain nights, during which a lanthorn is faſtened to the end of a long ſtick. The print is in quarto, and has a ſtriking effect of night. A pair of “Lion Hunting.” A chace of lions, in one of which a Turk is combating a lion, and another hunter is overthrown; “The Wandering Muſicians,” commonly called “The Blind;” it repreſents an old man and boy playing the bagpipes. “The little Spaniſh Gipſey,” repreſenting an old woman in a wood, converſing with a young perſon of diſtinction; “The Rat-Catcher,” repreſenting an old man with a ſtick, accompanied by a boy with rats in a trap, all in quarto; “The little Goldſmith,” a man occupied in forming a ſmall figure of Charity, in 12mo. with a very fine tone; “The Pancake Maker,” an old woman frying pancakes, ſurrounded with children, one of whom is crying at a dog, in octavo, engraved in a very delicate ſtyle; “The Jew's Synagogue,” repreſenting two doctors of the law converſing; in the back-ground is a ſynagogue. “The Nail Cutter,” a young woman ſeated, and an old woman on the ground cutting her toe-nails, a very rare print; “The Schoolmaſter,” in octavo; “The Quack Doctor,” taking drugs from a baſket, in 12mo., a very ſparkling engraving; “The Peaſant, with his Wife and Child,” an unfiniſhed print; “The Jew with the Large Hat,” leaning on a ſtick, engraved in a free, but deciſive manner; “The Onion Woman,” repreſenting a miſerable old woman, with her feet on a chaffing-diſh, anxious to ſell a rope of onions, all in octavo; “The Aſtrologer,” an old man in a profound ſleep, ſitting at a table with a candle, a globe, and books: in his right-hand he holds a pen, and his ſpectacles in the other; a quarto plate, with a very fine effect. “The Philoſopher” in his apartment, contemplating a globe by candle light, has a very brilliant effect, in 12mo.; “A Man meditating,” ſeated at a table, above which a lamp is fixed againſt the wall, which throws a glimmering light on all around, in quarto; “The Perſian,” a man in a hat and feathers, with a cloak on, in octavo, engraved in a very delicate ſtyle; “The Skaiter,” a man ſkaiting with a bundle acroſs his ſhoulder, in octavo, a very free, delicate engraving, rare.

Beggars.—A beggar in rags, leaning on a ſtick; the profile of a beggar, in the ſtyle of thoſe of Callot; another in the ſame ſtyle; an old beggar woman ſoliciting charity. Lazarus Klap, a dumb beggar, ſeated on the ground, with his ſtick between his legs, in 8vo.: this is engraved in a broad ſtyle, and is very rare; a beggar ſeated on the ground, covered with rags, in his countenance is pictured extreme miſery; beggars at the door of a houſe receiving charity: the group is compoſed of an old man, a young woman with an infant at her back, and another child, in 4to. This print is the moſt intereſting, and the beſt executed of the whole ſet.

Various Figures, academical, &c.—A young man and female in bed, ſurrounded with curtains, very rare; a ſhepherdeſs ſeated at the foot of a rock, making a garland of flowers, and a young ſhepherd lying near her, playing the flute, in 4to., a very rare engraving; “The Draughtſman,” repreſenting a man drawing from a caſt of a female, ſurrounded with other models: this print in Holland is known by the name of “The Statue of Pygmalion;” and if it had been finiſhed as well as it was begun, would have been very fine, in folio; “The Bath,” repreſenting figures bathing, in 4to.; “The Woman and the frying Pan,” in folio; “Venus at the Bath.” It has been remarked, that Rembrandt was not very happy in drawing naked figures; but here he has given his Venus the character of a goddeſs, in large 4to.

Landſcapes.—A ſmall landſcape, engraved with great freedom, of trees and a houſe; “The Bridge of Six,” with figures on it, in folio; a view of Amſterdam, a very good engraving; a landſcape, with a village and ſpire, on the fore-ground of which is introduced a hunter with two hounds, very rare, in folio; a very rich and celebrated landſcape, known by the name of “The three Trees,” with the effect of rain, in folio; a very highly finiſhed landſcape, into which is introduced a girl with pails, and a dog; a landſcape, with wood, water, and buildings: this engraving is very rare and ſingular, being waſhed with Indian ink, which gives it the appearance of a drawing. A pair of landſcapes, one with a coach in it, with a view of a city and two windmills; the other is a mountain ſcene, with wood and water, in 4to., in the form of friezes, both waſhed with Indian ink; a landſcape, arched at the top, of a village, with peaſants before a cottage in the fore-ground: it has a very grand effect. Another village ſcene, arched at the top, with a ſquare tower introduced, and two ſmall figures ſeated on the ground; a landſcape, with two cottages, and animals feeding on a meadow; on the fore-ground a figure is introduced drawing: this engraving is known by the name of “The Landſcape Painter.” A landſcape, executed with the dry point, called “The Cluſter of Trees,” among which is introduced a ſoldier's hut; a landſcape, arched at the top, known by the name of “The Hay Stack,” towards the right is a village and wood, and a flock of ſheep guided by a ſhepherd, all in 4to.; a large landſcape of an oblong form, repreſenting a cottage with a ſtream running before it, over which is a wooden bridge, and a country girl croſſing it: in the back-ground is a town, and a river, which winds to the fore-ground, where a man is introduced angling, with a child beſide him; its companion is a landſcape of the ſame ſize and form, of a canal and a large tree, by the ſide of which a cottage is repreſented with two children at the door: in the back-ground is a village and a windmill. “The Obeliſk,” a very well finiſhed landſcape, of a circular form, of an obeliſk and a village, with water, in 4to.; “The Windmill, or Birth-place of Rembrandt,” with his father's houſe; a view of the champaign of the receiver Utenbogaerd: towards the right hand of the print is a canal, with buildings, and two villages in the back-ground, both in large 4to.

Portraits of Men.—An old man, with a long grey beard, a very fine portrait, though left unfiniſhed at the death of Rembrandt. G. F. Schmidt purchaſed the plate and finiſhed it. A man with a chain and croſs, in the act of writing; John Antonides vander Linden, profeſſor and doctor of medicine at the univerſity of Leyden, in his robes of ceremony, a very fine portrait; James Silvius, clergyman of Amſterdam, in robes trimmed with fur, ſeated at a table, all in 4to.; a young man ſeated, meditating: he has on a robe trimmed with fur, in 8vo.; the Jew Manaſſeh Ben Iſrael, a commentator on many of the viſions of the prophets: he is repreſented with a pointed beard, and a hat with a large round border. Doctor Fauſtus, (whom Gerſaint calls Fautricus,) a profile, down to the waiſt, is dreſſed in a robe, and wears a white hat: he is in the act of examining magical characters, a very rare portrait. Renier Anſloo, an anabaptiſt, ſeated before a table, writing, with a hat on: his gown is bordered with fur. This is the moſt finiſhed and the fineſt portrait we have from the point of Rembrandt. Clement de Jonge, a print-ſeller, ſeated in an eaſy chair, with a hat on, and his hair plaited: this plate is arched at the top. Abraham France, an amateur of engravings, ſeated at a table, examining a print; the elder Haring, with a leathern cap on; the younger Haring, ſon of the preceding, ſeated; John Lutma, a famous goldſmith of Groningen, one of the fineſt portraits of Rembrandt: he holds in his hand a little figure of metal, all in 4to. John Aſſelin, a painter of Antwerp, known in Holland by the name of "Crabbetje," or little John: it is a half-length portrait, with long hair, and a hat on: before him is a table, with a palette and books, in folio. Ephraim Bonus, a Jewiſh phyſician, with a hat on, in the act of deſcending a ſtair-caſe This is one of the beſt of Rembrandt's portraits, all in 4to. Utenbogardus, a miniſter of Holland, in an oval, on an octagon plate: he is ſeated at a table, with an open book before him, and has on his head a leathern cap, in folio. John Cornelius Silvius, in an oval, around which is inſcribed "Spes mea Chriſtus. Johannes Cornely Sylvius. Amſtelodamo bat. functus S. S. Miniſt. aos 45 et 6 menſes. In Friſia, in Tyemarum et Phirugum aos 4," &c. Utenbogaerd, the banker and receiver of the ſtates of Holland, commonly called "the gold-weigher;" the little Coppenol, the Dutch writing-maſter; the great Coppenol, both very rare prints, all in folio; the lawyer Tolling, a very fine and rare portrait: he is repreſented ſeated at a table with books, in large 4to. The burgomaſter, John Six: this celebrated portrait is very rare, and ſold at Mr. Groſſe's ſale, ſome years ſince, for five-and-thirty guineas. It is ſaid, there is an impreſſion of this plate without the names of the burgomaſter or Rembrandt, in folio.

Ideal Heads of Men.—An eaſtern figure, with a little cap on, and ſhort hair, covered with a fur gown; a profile, with a turban on; an eaſtern figure, with a long beard, in a turban, very rare. Theſe are all marked "Rembrandt Venetiis, 1635:" and it is ſaid that he ſo marked them, to make the amateurs believe that he had been at Venice. Buſt of a man with a ſhort curly beard, in a black gown; buſt of an old man, with a long beard, whoſe head is reclining as if he ſlept; an old man, with a long grey beard, and very little hair on his head, habited in a long robe, in 8vo.; a young man, half-length, in profile; buſt of an old man, with a ſquare cut beard, with a velvet cap on; a man, with muſtachios, half-length, with a hat on, and a gown trimmed with fur; a half-length portrait of a man ſeated, at an eaſel painting, inſcribed "W. Droſt," moſt probably the portrait of Rembrandt's pupil, Droſt, very rare; the buſt of a young man, with long hair, engraved on a white ground, ſuppoſed to be Titus, the ſon of Rembrandt, in 4to., rare; a half-length profile of a man, with the phyſiognomy of a negroe, with a turban on, in 4to.; a philoſopher, with a ſable, a long ſquare bearded head, with a fur cap on.

Female Portraits.—A three-quarter view of a young Jeweſs, ſeated, in folio; the little Jeweſs, newly married, three-quarter, with long hair hanging on her ſhoulders; two portraits of old women, in black veils, very highly finiſhed, in 4to.; "The Reader," a young woman ſeated at a table, reading, a very good engraving; and its companion, an old woman, reading, in 4to.; a half-length profile of a lady with her hair dreſſed with beads, in 8vo.; an old woman, with her hair dreſſed in the eaſtern ſtyle, ſeated. It is engraved in ſo delicate a ſtyle, that a clear impreſſion is ſeldom met with. A buſt of the mother of Rembrandt, with her hair dreſſed, in a black veil; an old woman aſleep, reſting her head on her hand, dreſſed in a turban; buſt of an old woman, three-quarters, in a black veil, engraved in a broad ſtyle, in 12mo., very rare; the profile of a young girl in a hat: ſhe holds a baſket acroſs one arm, and a purſe in the other hand. A nearly profile head, in a veil turned up, and a feather, in 8vo.; an old woman with ſpectacles, a half-length profile, reading, a very ſpirited engraving, and very rare.

Studies and Sketches, &c.—Several ſtudies engraved on the ſame plate, among others we diſcover a head of Rembrandt himſelf; a clump of buſhes, ſurrounded with a wall, a horſe, and ſeveral heads, very rare; ſtudy of ſix heads, among which is the wife of Rembrandt; ditto of five heads of men; ditto of three female heads, a very ſpirited engraving; a plate of ſtudies of various heads and figures; ſet of ditto, among which we diſtinguiſh the head of Rembrandt, with other figures: this is very freely engraven, and is one of the rareſt of the ſtudies of Rembrandt. A very taſteful unfiniſhed engraving of various objects, and a tree, very indefinite, in 12mo.; profiles of three old men's heads, in 8vo. All the preceding are of quarto ſize.

Doubtful Subjects.—"King David kneeling, at Devotion, crowned;" "A Repoſe during the Flight into Egypt," with the effect of night; the Holy Family are ſeated on a bank at the foot of a tree, to which is faſtened a lanthorn, which caſts a glimmering light over the whole ſcene, in octavo. "Jeſus Chriſt taken to Calvary," a very rich compoſition; "A Skirmiſh, or Village Fair," a very fine engraving, in a ſlight ſtyle; on the fore-ground is a rat-catcher holding a baſket on the end of a long ſtick, with rats in it. A buſt of a man, with a bandolier on his ſhoulder, with a double claſp of precious ſtones; "The Pen maker," an old man ſeated at a deſk, with ſpectacles on, mending his pen; "The young Scholar," ſeated on a ſtone at the foot of a tree writing, very rare; buſt of an old man laughing, with a little hat on: this is executed entirely with the dry point, and finiſhed in a very good ſtyle, all in 4to. Klaas van Ryn ſeated, with a long beard, inſcribed on the margin with his name, in 12mo.; and three dromedaries, followed by two camels, with eaſtern trappings, engraved in a free ſpirited ſtyle.

John Lievens, Livens, or Lyvyns, was born at Leyden in the year 1607. He became the pupil of George van Schooten, and afterwards of Peter Laſtman. He excelled principally in painting portraits, but likewiſe executed ſome hiſtorical pictures with great ſucceſs. In the year 1630, he came into England, where he reſided three years, and painted the portraits of Charles I., the queen, the prince of Wales, and ſeveral of the nobility. Lievens made a conſiderable number of engravings and etchings, ſomewhat in the ſtyle of Rembrandt, ſcarcely leſs pictureſque, but coarſer, and in general leſs finiſhed; but he always managed his chiaroſcuro ſo as to produce a very good effect.

Adam Bartſch informs us, that Lievens drew more correctly than Rembrandt, (which he might eaſily do,) but did not engrave in ſo pictureſque a ſtyle; thoſe plates which he meant to finiſh highly he executed with a very delicate touch, and ſometimes he uſed to hatch ſo cloſe, that the aquafortis bit his lines nearly into a blot; for inſtance, thoſe which are on the fore-ground of "The Reſurrection of Lazarus." It does not appear that this artiſt made much uſe of the dry point, but frequently uſed the graver to ſtrengthen the ſtrokes. His print of St. Jerome is ſtrongly retouched with that tool, and two of his fineſt portraits, thoſe of Daniel Heinſius, and Jacques Gouter, are wholly executed with the graver; they are in a very pictureſque ſtyle, and bear ſome reſemblance to etching. He marked his prints either with his initials, or his name, which he ſometimes ſpelled Lyvyns. The following are a ſelection of thoſe engravings by this maſter, which are moſt worthy the notice of the collector.

Portraits and Heads.—Doctor Ephraim Bonus, a half figure ſeated; Jooſt, or Juſtus Vondel, a Dutch poet; Daniel Heinſius, profeſſor of hiſtory and politics at Leyden; Jacobus Gouter, the Engliſh muſician, a half figure, with a lute, all in folio; an old man with his head ſhaved and a long beard, taken for the portrait of Conrad Leonard, an early preacher of the goſpel in Greece; the profile of an old man, with a long beard; buſt of a man with a turban on, very fine, after Rembrandt; ditto of a man, with long hair; half-length figure of a woman, with long hair; buſt of a young man, with an open robe, in the ſtyle of Rembrandt, all in quarto; ditto of a man, with a bonnet on, in the taſte of Rembrandt, in 12mo; profile of an old man, with a ſhort beard; profile of an old man, with a long and pointed beard; a half-length portrait of an old man ſeated, all in quarto; buſt of an old man, with a ſhort beard and bald head, in octavo; ditto of a Perſian, with a cap and robe; ditto of a man, with curly hair; profile of a man, with a hat on; ditto of an old man, with a little cap on; ditto of an old woman, with a veil on, in the ſtyle of Rembrandt; ditto of a young woman, with a pearl ornament on her head; profile of a woman, with her hair falling on her ſhoulders; head of a young woman, with the character of a negro, all in 12mo.; buſt of a Capuchin, with a long pointed beard, and a hat and mantle, in folio.

Hiſtorical, &c.—"The Virgin and Infant Chriſt," with St. Joſeph, and various other figures, in octavo; "The Virgin and Infant Chriſt," to whom ſhe preſents a pear; "The Reſurrection of Lazarus," a grand compoſition, in folio; "St. John the Evangeliſt ſeated at the Foot of a Tree, with a Book," in quarto; "St. Jerom ſeated in his Cell, holding a Crucifix and a Skull," in folio; "St. Francis in his Cell, meditating," in large quarto; "The Anchorite," or St. Francis, differing very little from the preceding engraving, in quarto; "St. Anthony ſeated, with a long Beard, and a Capuchin Cowl," in folio, very rare; "Mercury and Argus," in large quarto; "Jacob performing a Sacrifice;" an eaſtern figure in a cloak; buſt of a man in eaſtern attire, with a chain round his neck, in folio, both on ſhadowed grounds; buſt of a man with long curly hair falling on his ſhoulders, in large 4to.; an engraving of three trees, without any back-ground, in folio: both theſe engravings are executed on wood, but do not poſſeſs any great ſhare of merit. "Death ſtriking two Peaſants," who are repreſented gaming and quarrelling, of folio ſize.

Eraſmus Quellinus was born at Antwerp in the year 1607, and died in the ſame city, in the cloiſter to which he had retired in 1678. He ſhewed an inclination early in life for the arts, and ſtudied under Rubens: he became an hiſtorical painter of conſiderable merit, and likewiſe executed ſome landſcapes in a very maſterly ſtyle. Quellinus etched ſome plates from his own compoſitions and thoſe of Rubens, of which it may be ſufficient to ſpecify the following: Eraſmus Quellinus, which was publiſhed with an account of his life in the French language, in quarto; a folio landſcape, with a dance of ſatyrs and children, rare; "Sampſon killing the Lion," in quarto, from Rubens; and "The Holy Virgin and Child," in folio, after Rubens.

Hubert Quellinus was born at Antwerp in 1608; he was of the ſame family as the preceding artiſt, and brother to Artus Quellinus the ſculptor. Hubert engraved ſomewhat in the ſtyle of Soutman, bringing his plates very forward in the etching, and finiſhing them with the graver in a very neat pleaſing ſtyle.

He uſually marked thoſe plates which he engraved from the ſculpture of his brother with the initials of Artus, as well as his own. The following are ſelected from the works of this artiſt as being moſt worthy of attention.

A ſet of the ſtatues which his brother Artus executed in marble, for the Stadthouſe of Amſterdam, after the drawings of John Bennokel, in a folio volume. The portrait of Artus Quellinus, alſo in folio; a fulſome piece of adulation offered to Philip IV. of Spain, who is repreſented on his throne, ſurrounded by allegorical virtues, &c.; "The Judgment of Solomon;" "The Legiſlator Zaleucus redeeming the Penalty of his Son;" "The Province of Holland," perſonified and ſurrounded with emblematical figures; and a ſet of twelve plates of naval and military triumphs, and other decorative ornaments of the Stadthouſe at Amſterdam, all of folio dimenſions.

Theodore van Thulden, of Dutch anceſtry, was born at Bois-le-Duc in the year 1607; but became the diſciple of Rubens, whom he accompanied to Paris, and aſſiſted in his grand undertaking of the Luxembourg gallery.

He painted a few other pictures which are deſervedly held in eſteem, and etched a conſiderable number of plates in a firm, clear, and determined, but ſlight ſtyle.

In his praiſe as an engraver, much cannot be ſaid. His chiaroſcuro is but feeble; to expreſſion of the textures of ſubſtances, he gave little heed, and his drawing is ſo mannered, that the ſpectator of obſervation eaſily traces in his prints the ſame hand, though working after very different maſters.

He engraved the principal events in the life of St. John of Matha, in a ſet of twenty-four ſmall folio plates, from pictures with which he adorned the church of the Mathurins at Paris; "The Hiſtory of Ulyſſes," on fifty-eight ſmall plates, from the pictures of Primaticcio at Fontainbleau; "The triumphal Entry of the Infanta Ferdinand into the City of Antwerp," on eight folio plates, after Rubens; a ſet of ſix ſmaller plates, from the parable of "The Prodigal Son," after the ſame maſter, beſide other works of inferior importance.

Janus, or John Lutma, was a goldſmith of Amſterdam, who diſtinguiſhed himſelf by the invention of a new mode of art, which had its day of novelty, and was for a time popular among ſuperficial connoiſſeurs; it was termed *Opus Mallei*, being performed with a *hammer*, and ſmall pointed punches, which made an impreſſion upon the copper, and by being repeated as occaſion required, the ſhadows were formed either darker or fainter, at pleaſure. The burr, which was neceſſarily raiſed upon the ſurface of the copper by ſuch an operation, was not entirely removed by the ſcraper; and in the early impreſſions, is the means of producing a ſoft and agreeable effect. He engraved four plates in this ſtyle, which are as follows: Janus Lutma; John Lutma, his father; the poet Vondel; and P. C. Hooft, the hiſtorian, all of them in folio, and apparently from his own drawings.

John Lutma, the ſon of the preceding artiſt, was born at Amſterdam, A.D. 1609. He was likewiſe a goldſmith, and executed ſome few plates; among others the following: the portrait of John Lutma the father, habited in a robe bordered with ermin, holding ſpectacles and a pencil; portrait of himſelf, ſeated at a table, drawing; he has on a broad brimmed hat, which overſhadows his face: this print is very rare, both in folio; and a view of a large fountain with ſtatues, and the Antonine column, with ſome other ruins at Rome. It is firſt etched in a coarſe, bold ſtyle, and the ſhadows are worked upon with a fine mezzotinto tool. The effect produced by this mixture is confuſed and heavy, but not altogether diſagreeable to the eye.

James Lutma was of the ſame family, and alſo reſided at Amſterdam; by this artiſt we have a ſet of twelve middling-ſized upright plates of ornamental ſhields and foliage, etched in a neat ſtyle and finiſhed with the graver; likewiſe the portraits of the three Lutmas, marked "John Lutma of Oude inv. James Lutma fecit, aqua forti."

Adrian Brouwer, ſo celebrated for his attainments in art, and his wild and immoral habits, executed a few plates about this period, of ſuch ſubjects as he uſually painted. (For his biography, ſee the article Brouwer.) His principal etchings, which are executed with much ſpirit, freedom, and taſte, and are generally ſubſcribed with his initials, are, a party of four peaſants, inſcribed "T'ſa orienden," &c.; a ruſtic dance, where a female is playing the flute, inſcribed "Luſtig ſpell," &c. both in folio. Three peaſants ſmoking, inſcribed "Wer aent ſmoken," in ſmall folio; a drunken party of four ruſtics; two peaſants in converſation; a droll ſmoking party, conſiſting of a man, a woman, and an ape, inſcribed "Wats dit voor en gedrocht," &c.; a ruſtic baker making cakes, a circular print; a peaſant lighting his pipe, and a ſet of ſix of male and female peaſantry; all of quarto dimenſions.

Solomon Koninck was born at Amſterdam in the year 1609, and was the ſon of Peter Koninck, a celebrated connoiſſeur and jeweller of that city, who at the age of twelve placed his ſon under David Colyn, to learn the rudiments of drawing; he afterwards ſtudied ſucceſſively under Francis Vernando and Nicholas Moyart, and became a painter and engraver of ſome eminence. He etched ſeveral ſubjects in the ſtyle of Rembrandt, after his own deſigns; of which the following conſtitute the more eſtimable part. A head in profile, of an old man with a long beard; ditto of an old man, in eaſtern attire, with muſtachios; a companion to the preceding, but engraved in a much more delicate manner; a three-quarter buſt of an old man with a furred hat; an old man ſeated in an eaſy chair, at devotion, a very fine engraving; buſt of a venerable looking old man, with a beard; and a landſcape with cottages, all of quarto ſize.

Nicholas Berghem alſo performed ſome etchings about this time, which conſiſt chiefly of what may be termed Italian and Dutch paſtorals, and beam with taſte and intelligence. It is believed that all his prints are ſolely the reſult of aquafortis and the etching-point, and that his plates were never touched with the graver. They are all from his own compoſitions, and for the moſt part appear like tranſcripts from the ſketch-book, wherein he drew animals from nature.

The etchings of Berghem, like his pictures, delight by the ſound and intimate knowledge of drawing and chiaroſcuro, which they diſplay or imply; and the exquiſite feeling which every where attends his touch, and which ſeems almoſt, ſpeaking without figure or hyperbole, like actual contact between mind and its object.

Theſe are the qualities which impart ſuch truth of texture and character to his various domeſtic animals, whether rough or ſmooth-coated; ſuch pictureſqueneſs to his graſſy grounds and earthy and rocky banks, and ſuch importance to his trifles.

For the biography of this artiſt, ſee Berghem, Nicholas. In conformity with our general plan, we ſhall here add ſome account of his principal engravings, referring thoſe who may wiſh for more particular information, to the catalogue of Henry de Winter, which was publiſhed in Holland in the year 1767.

Six ſets in ſmall quarto, of ſix prints each. Theſe are performed with all the fire and fervour of Berghem, and each ſet conſiſts of five plates of animals, and an appropriate title-page, by which the ſet is known, *e. gr.* there is "The Milk-man" ſet, "The Shepherdeſs" ſet, "The Goatherd" ſet, &c. &c. The title-pages are all inſcribed with the following words, which ſhew that they are, as we have before ſurmiſed, the probable contents of the ſketch-book in which our artiſt was accuſtomed to draw from nature; *viz.* "Animalia ad vivum delineata et aquaforti ceri impreſſa ſtudio et arte Nicolai Berchemi." A ſet of five folio landſcapes, which are diſtinguiſhed from each other by the figures and cattle which are introduced, and which are as follow: 1. A Peaſant ſeated playing on the Flute. 2. A Group of Cattle, with a Woman and Child croſſing a Rivulet. 3. A Shepherd, with Sheep and various Cattle. 4. A ruſtic Girl on an Aſs, ſtopping for Refreſhment at an Alehouſe Door. 5. A Shepherd on horſeback, reading to a Woman on an Aſs, as they ſlowly travel. A ſet of four, in quarto, *viz.* 1. A Landſcape, with Oxen, and a Woman milking a Cow. 2. Another with three Horſes and two Cows, with a Shepherd in the Back-ground. 3. Another with two Cows, and ſome Goats. 4. Another with an Aſs, Goats, and a Shepherd; and a ſet of ſix ſmall plates, which are very rare, and uncommonly fine, of heads of rams and goats.

Detached Subjects of Berghem.—A cow, in folio, the earlieſt impreſſions of which have the name of Berghem in italics; a famous print of a cow watering, in folio; a landſcape with two cows lying down, and another ſtanding on the foreground; a landſcape with cows, and a man on an aſs; a landſcape, with a ſhepherd on an aſs, driving goats, in the back-ground a woman is introduced with a baſket on her head, all in folio; a woman waſhing her feet in a brook, and a man behind her leaning on a ſtick, with other ruſtic figures and animals, in large folio; a landſcape, with a man ſtanding playing the flute, and a woman ſeated on the ground near him, a rare print, in folio; and its companion, a ſhepherd, and his wife ſeated ſuckling her child, a very rare print; and a boy ſeated on an aſs, ſpeaking to another boy, who holds a pair of bagpipes.

The beauty and value of the works of this maſter depend much upon the impreſſions, and early, good, and well preſerved impreſſions are now become very ſcarce.

The author of the Abecedario, miſled by the cypher of Berghem, which the reader will find in our *Plate* III. of the monograms of the engravers of the Netherlands, has fallen into the error of calling him Cornelius Berchem. Florent le Comte has alſo ſuppoſed that there were two artiſts of this ſurname, one of whom he calls Cornelius; whereas the letter C in Berghem's cypher ſtands for Claus, the common abbreviation of Nicholas among the nations of the continent.

Herman Zacht-Leeven, or Sachtleeven, was born at Rotterdam, A.D. 1609, and died at Utrecht in 1685. He was the diſciple of John van Goyen, and became a landſcape-painter of great celebrity. He etched ſome few plates in a free and intelligent ſtyle from his own compoſitions, of which the following are the beſt; a landſcape and cattle; a mountainous landſcape, with figures and water; both in quarto. A ſet of ſix landſcapes, the firſt of which is executed by Ag. Winter, and the remainder by Sachtleeven, in quarto; and a landſcape, with two elephants, in folio.

Cornelius Sachtleeven was the younger brother of Herman, mentioned in the preceding article, and was born at Rotterdam in the year 1612. He painted in the ſtyle of Brouwer and Teniers, commonly ſelecting ſuch ſubjects as village parties, ſoldiers regaling, &c.

This artiſt likewiſe etched ſeveral plates from his own compoſitions in a ſlight ſpirited ſtyle; amongſt which the following are thoſe which are held in moſt eſteem. "The Five Senſes," intitled "De vyf Sinnen, wt ghebelt door Cor. Sachtleeven." A ſet of twelve ſmall plates of animals; and a landſcape, with animals and a goatherd, of quarto ſize; executed in a broad and pictureſque ſtyle.

John George van Vliet was born at Delft in the year 1610; and was one of the moſt ſucceſsful of the diſciples and imitators of Rembrandt. He executed a conſiderable number of etchings, ſome of which poſſeſs great merit, particularly thoſe from the drawings and pictures of his great maſter. They are exceedingly powerful in effect; the ſhadows being dark, and the lights broad and clear; but his figures in general are very incorrect, the extremities badly marked, and the draperies heavy.

Van Vliet uſually etched his plates with a very delicate point, afterwards ſtrengthening them with aqua-fortis and the graver. His plates are well worthy the obſervation of ſuch artiſts as wiſh to make a proper diſtribution of light and ſhade an eſſential part of their ſtudy. At the ſale of Mariette, a complete ſet of his works was ſold for one thouſand and ſeventy-five livres. He commonly marked them with his name, or a monogram, which will be found amongſt thoſe of the engravers of the Netherlands. The following are the moſt worthy the attention of the connoiſſeur.

Portraits and ideal Heads.—Buſt of a man, from Rembrandt; an Oriental head, dreſſed in a turban, and diamond ornament; head of a warrior; profile of an old man, with his hands claſped, looking upwards; ditto of an old man with a grey beard and a leathern cap; ditto of a man with muſtachios, and a fur bonnet and mantle; all in folio. Buſt of an old man with muſtachios, habited in a mantle; Profile of an officer, with a hat and feathers, both in quarto; and a beautifully finiſhed plate of an old woman reading, her head is covered with drapery which falls on her ſhoulders, in folio; all from the pictures of Rembrandt.

Hiſtorical, &c.—"Lot and his Daughters," a folio print, in which the chiaroſcuro is remarkably well managed. "The Baptiſm of the Eunuch of Queen Candace," a grand compoſition, of which good impreſſions are very rare, in large folio; "St. Jerom kneeling, at Devotion," a very fine print; all from Rembrandt, and in folio. "St. Jerom reading," from a picture by Van Vliet himſelf; "Iſaac diſcovering his Miſtake in having given his Bleſſing to Jacob;" "Suſanna ſurpriſed by the Elders," both from Livens, in large folio; "The Reſurrection of Lazarus," from his own compoſition, in large folio. John Louys copied this print, and his copy is ſuperior to the original. "The Ballad-ſinger," who is repreſented in a village ſtreet, ſurrounded with ruſtics, in folio; "The Rat Seller," in quarto; four figures in Spaniſh attire, playing at trictrac; a woman and child liſtening to a man who is ſeated on a baſket turned upſide down; "The Philoſopher reading," with a remarkably fine effect; "The Mathematician writing by Candle-light," all in quarto; "An Orgie of Peaſants," a very good compoſition, of ſix figures, in folio; all from his own deſigns.

Ferdinand Bol was born at Dordrecht in the year 1610, but lived and died at Amſterdam, where his parents came to reſide when he was but three years old. He ſtudied in the ſchool of Rembrandt, and attained great celebrity as a painter of hiſtory and portraits. He executed a conſiderable number of plates in a bold free ſtyle; the lights and ſhadows are broad and powerful, which renders the chiaroſcuro of Bol particularly ſtriking; but his prints want that lightneſs of touch and admirable taſte which thoſe of Rembrandt poſſeſs in ſuch high perfection. The following are a ſelection of the beſt engravings of Bol, and are nearly, if not quite, as much ſought after as thoſe of Rembrandt.

Portraits and Heads.—Half-length portrait of a young man, with a hat on; portrait of an officer, both in 4to. Half-length portrait of a man, with a hat and feathers; a young woman with a cap and feathers, in an oval; both in 8vo. The woman and the pear, being a portrait of a young female in a veil, preſenting a pear, a very fine print, in 4to. An old man ſeated, habited in a fur robe, in large 4to., a rare print. A very ſpirited half-length engraving of an old man, with a cap on. And a buſt of an old man habited in a fur robe, in an oval of quarto ſize, very rare.

Hiſtorical, &c.—"A Philoſopher in his Study," with globes, books, &c. and a very fine effect; "A Philoſopher reading." An old man ſeated before a table, on which are placed globes and books. This print is commonly known by the name of "The Aſtrologer," all in 4to. A family in a room, conſiſting of a man, woman, and child ſucking, known by the name of "The Chamber of the Accoucheur" in folio; "Abraham's Sacrifice," arched at the top, in large folio; "Hagar and Iſhmael in the Deſart," in folio; "The Sacrifice of Gideon," repreſented at the moment when the angel lights the ſacrifice, in the back-ground is the altar of Baal, in 4to.; and "St. Jerom contemplating a Crucifix," in a circle of folio ſize.

The events of the life of Dirick or Theodore Stoop are very obſcure. He was born ſomewhere in Holland in the year 1610, or thereabouts, but how he acquired his great ability in painting and etching is not known. His etchings are from his own compoſitions, are performed in a very neat and pictureſque ſtyle, and are much and deſervedly celebrated, and highly valued.

His principal work is a ſet of twelve plates in ſmall folio, of which the ſubjects are horſes, dogs, and peaſantry, engaged in various rural occupations, and marked D. Stoop, fec.

Rodrigo Stoop was the younger brother of Theodore, and was born in Holland, A.D. 1612. According to the author of "An Eſſay towards an Engliſh School of Painters," the baptiſmal name of this artiſt was Peter, but he always placed the initial R before his family name, and is called Rodrigo by the continental writers. He came into

England with queen Catherine, and reſided here till the time of his death, which happened in 1686.

This artiſt engraved ſeveral plates, after his own compoſitions and thoſe of Barlow. They are executed with great ſpirit, in a ſtyle which does him much credit, but we can only ſpecify the following: A ſet of eight, views of Liſbon, dedicated to queen Catherine; another ſet of eight, repreſenting the proceſſion of queen Catherine from Portſmouth to Hampton Court, dated 1662; and ſeveral of the plates for Ogilby's edition of Æſop's Fables, publiſhed in 1678, after Barlow. Theſe are ſlight haſty performances.

Anthony van der Does was born at the Hague in the year 1610. He chiefly engraved portraits; if he was not the diſciple of Paul Pontius, he imitated his ſtyle; and although he never equalled that great maſter, yet his beſt engravings poſſeſs a conſiderable ſhare of merit. He engraved moſt of the plates for a collection of portraits of the illuſtrious men of the ſeventeenth century, publiſhed at Amſterdam, many of which are dated 1649. Among his beſt portraits are thoſe of Gerard Cock, a plenipotentiary to the court of Oſnabruck; George Wagner, plenipotentiary to the court of Oſnabruck, both in folio, after Anſelm Van Hull; Ferdinand, cardinal infanta of Spain, and governor of the Low Countries, after Diepenbeck, in large folio; the marquis of Caſtle-Rodrigo, after Rubens, in large 4to.; Francis de Mello, ſmall folio; Francis de Mello, on horſeback, in folio, from J. Boſſart.

And of his *Hiſtorical Prints*, the moſt eſteemed are "A Magdalen," half figure, in 4to., from Vandyke; "A Miracle performed by St. Francis," after Diepenbeck; "A Madonna and Child," after Eraſmus Quellinus; and "A Holy Family," from the ſame painter, both in folio. The Holy Family is accompanied by two angels, one of whom is ſtrangely employed in warming linen for the child, whilſt the other makes its bed. Of the remainder of this family of artiſts, we have already treated in vol. xii. See Does, Jacob and Simon, Vander.

An account of the lives and works of Cornelius Bega, and Leonard Cooghen, (which ſhould elſe have been introduced in this place,) will alſo be found under thoſe heads reſpectively. The plates of the former, impreſſions from which are much ſought after by connoiſſeurs, have recently been purchaſed and republiſhed by a foreign print merchant, with deſcriptions in the French and Dutch languages. They amount to thirty-four plates of humorous and vulgar ruſticity.

Edward Eckman, or Ecman, was born at Mechlin in the year 1610. He was a moſt excellent engraver on wood, and copied many of Callot's prints, even imitating the free ſtyle of that maſter with great ſucceſs. The diſtant parts of his engravings are very neatly executed; and the perfect forms of the ſmalleſt figures exceedingly well preſerved. Among other engravings by him, is the repreſentation of the fire-work upon the river Arno, from Callot, which Papillon, who has certainly judged well in this inſtance, calls an admirable print, adding, that it is impoſſible to find a more delicate engraving on wood.

Eckman engraved alſo from Louis Buſink, Abraham Boſſe, and others. The number of his prints is ſaid to be one hundred and five.

John Thomas was a native of Aſpres, and born in the year 1610. He was a ſucceſsful pupil of Rubens, and afterwards, in company with his fellow ſtudent Diepenbeck, went to Italy, where he met with great encouragement from the biſhop of Metz. In 1662 he was intitled firſt painter to the emperor Leopold, and had a conſiderable penſion allowed him by that prince.

Thomas etched ſeveral plates, in a bold, free, and ſpirited ſtyle, which are much ſought after by collectors, among which the following may be reckoned the beſt. "Mercury conducting a Ghoſt before Hecate;" "A Lady at her Toilette;" "A Shepherd careſſing a Shepherdeſs;" "A Satyr offering Violence to a Shepherdeſs;" all of 4to. ſize, from his own deſigns; and a paſtoral ſubject, compoſed of ſix figures, three men and three women, one of the former is playing upon the bagpipes, in folio; likewiſe from his own invention. The two latter are compoſed ſo much in the ſtyle of Rubens, that ſome authors have attributed their invention to him, but without foundation.

John Troyen, or Van Troyen, was a native of the Low Countries, and born A. D. 1610. He produced ſeveral etchings from the pictures of Italian maſters, collected by D. Teniers, for the gallery at Bruſſels. They are executed in a ſlight, coarſe, incorrect ſtyle, but his prevailing tones of light and ſhade are tolerably good.

The following are the beſt part of them. "Salome preſenting the Head of St. John to the Daughter of Herod," after L. da Vinci; "The penitent Magdalen;" after Correggio; "The Adoration of the Kings," after P. Veroneſe; "Jeſus Chriſt healing the Sick," from the ſame painter; four ſubjects of "The Seaſons," after Baſſan, all in folio; and a grand compoſition, in large folio, after L. Pordonna, of "The Entombing of Chriſt."

Peter Liſebetius, or Van Leyſebetten, was the contemporary of Van Troyen, and, like him, was employed in engraving part of the gallery of Teniers. His plates are executed in a coarſe and incorrect ſtyle; among them are a portrait of David Teniers, ſenior, in 4to., from Van Mol; "Diana repoſing," attended by an old woman, after Titian; "The Marriage of St. Catherine," after P. Veroneſe; "The Viſitation of Elizabeth," after Palma the elder; "The Virgin at Prayers, and St. John careſſed by the Infant Saviour," after the younger Palma; "Cupid preſenting Venus with Fruit;" and "Diana and Endymion," after Paris Bordonna, all of folio ſize. The two laſt are remarkably ill drawn, and the reſt reach not above mediocrity.

John Meyſſens, or Mytens, was born at Bruſſels in the year 1612. He learned the principles of painting from Anthony Van Obſtal, and afterwards became the diſciple of Nicholas vander Horſt. He painted both hiſtorical ſubjects and portraits, but was moſt ſucceſsful in the latter. He reſided at Amſterdam, where he publiſhed ſeveral collections of engraved portraits, not only from his own paintings but thoſe of Vandyke, and a variety of other maſters. Meyſſens engraved and etched, and we have by him a collection of portraits which he publiſhed in 1649. Proſper Merchand, in his hiſtorical dictionary, mentions a book of portraits by this artiſt, (likewiſe publiſhed by himſelf,) which is become very rare, on the frontiſpiece of which is the name of "Speckkraemer." They are in general greatly inferior to what might have been expected from his hand, and do not do him much credit as an artiſt. Of theſe mediocre performances, it may be ſufficient to ſpecify the following, which are rather valued on account of the pictures from whence they are engraven, than on account of the merits of the engraver.

Portrait of himſelf; Henry de Keyſer, architect and ſculptor; Guido Rheni; Daniel Seghers, Jeſuit, and flower painter, from Livens; Cornelius de Bie, from Eraſmus Quellinus; William de Nieulandt, painter, from the ſame maſter; Mary Ruten, the wife of Vandyke; "The Virgin and Child," half figures, from Titian, all in 4to. And

"Meleager preſenting the Boar's Head to Atalanta," from Rubens, in folio.

Cornelius Meyſſens was the ſon of John, and born at Antwerp, A. D. 1646. He learned the elements of art under his paternal roof, but removed from thence to Vienna, where he remained ſome years. He ſeems chiefly to have been employed by his father in engraving portraits, which he executed entirely with the graver in a ſtiff, taſteleſs ſtyle. His beſt prints have no great merit to recommend them, and the reſt are mere ſlovenly performances, evidently executed in a hurry. The moſt conſiderable work we have by this artiſt is a ſet of portraits of the emperors of the houſe of Auſtria, in folio, entitled "Effigies Imperatorum domus Auſtriacæ, delineatæ per Joannen Meyſſens, et acri inſculptæ per Filium ſuum, Cornelium Meyſſens." This proves, beyond contradiction, that he was the ſon of John, and not the nephew, as Baſſan affirms. His work of next importance is in folio, and entitled, "Les Effigies des Souverains Princes et Ducs de Brabant." In theſe he was aſſiſted by Peter de Jode, Waumans, Van Schupen, and other artiſts. Octavius, duke of Arenburgh; Antonius Barberinus, Cardinalis Camerius, both in 4to; Rinaldo Principe Eſtenſe, cardinale protettore della Corona di Francia, in folio; Giovanni de Witt, Signor di Linſchoten, &c. Penſionario di Olandia; Caſparus Keidtwerdius, Paſtor Eccleſiac Veſala, from B. D. Meyes; and David Conte di Weiſſenwolff, Signor di ſon et Enſegg; S. B. Van Dryweghen delt. all of folio dimenſions, may alſo be admitted into collections of the ſchool of the Netherlands.

Marc de Bye was born at the Hague in 1612, of a noble family; he paſſed ſome of the years of his youth in the army of the Dutch republic, and became a member of the Academy of Arts in 1664.

He learned the principles of painting of James vander Does, painted animals with all the truth and taſte of that maſter, and etched ſeveral ſets of plates, of which the ſubjects were wild and domeſtic animals, in a very neat ſpirited ſtyle, after Paul Potter and Marc Gerard.

The following may be ſelected with advantage from the reſt of his works: Two ſets of eight quarto plates, each of horned cattle, after P. Potter; another ſet in quarto, from the ſame painter; a ſet of eight, of goats and ſheep; a ſet of ſixteen, of goats; a ſet of ſixteen, of lions, bears, wolves, leopards, &c. after the ſame painter; and a ſet of ſixteen, of "The Natural Hiſtory of the Bear," in different countries, after Marc Gerard, very rare prints, in quarto.

Francis vanden Wyngaerde was born at Antwerp in the year 1612, and eſtabliſhed himſelf in that city as an engraver and print-merchant. His works prove him to have been a man of ability; his etchings are executed in a ſlight and free, but maſterly ſtyle, and are much ſought after by connoiſſeurs. Among thoſe which are the moſt worthy of attention, are the following:

"Sampſon killing the Lion," from Rubens, in 4to.; "Jeſus Chriſt appearing to Mary Magdalen in the Garden," in folio; "The Marriage of Thetis and Peleus," in large folio; a bacchanalian ſubject, where Bacchus is repreſented drinking from a cup, into which a bacchanal is ſqueezing grapes, a fine and rare print, in large folio; "Soldiers regaling in an Alehouſe;" all after Rubens. "The Entombing of Chriſt," after A. Vandyke, both in folio; "Achilles diſcovered at the Court of Lycomedes," after the ſame painter, in folio; "The Return from Egypt," in which the Holy Virgin appears in a ſtraw hat, from J. Thomas, a fine engraving, in large folio; "Peaſants ſmoking and drinking before an Alehouſe Door," from Teniers; "The Temptation of St. Anthony," from his own compoſition, a very rare print; two women, one of whom is contemplating a ſleeping infant by candlelight, after Callot; and its companion, a female leaning on a ſkull before a looking-glaſs, after the ſame maſter, all of folio dimenſions.

Reynier, or Remigius Nooms, better known by his cognomen Zeeman, was born at Amſterdam in the year 1612. He was originally a ſailor, but having an innate love and natural talent for fine art, he accuſtomed himſelf to imitate on paper what he ſaw, and by purſuing this mode of ſtudy in the ſchool of nature alone, gradually became a marine painter and engraver of conſiderable rank and ability.

It ſhould be known that the Dutch word *zeeman* is ſynonimous with ſeaman, or mariner. As the imitative powers of *the ſailor* diſcloſed themſelves, his countrymen could not but behold his productions with ſome degree of pleaſing wonder, nor was due encouragement withheld. At one period of his life he accepted an invitation to Berlin, and if we may judge from twelve of his engravings of ſhipping, &c. which were publiſhed here by Tooker, he reſided for a time in London, but finally returned to Amſterdam, where he executed a conſiderable number of plates from his own deſigns, in a bold and intelligent ſtyle. They conſiſt of ſhipping and marine views, ornamented with good figures, and cloſed by back-grounds, which are often beautifully executed and appropriately introduced.

Of theſe, the moſt important are, a ſet of eight naval ſubjects, entitled "Quelques Navires," &c. dated 1632, in 4to.; another ſet of ſix, of views of public edifices on the ſea-ſhore, and the yatch which travels between Haerlem and Amſterdam, in folio; a ſet of twelve, of ſhipping, naval arſenals, &c. in folio, publiſhed in London by A. Tooker; four Dutch ſea-ports, in folio, entitled "Raan Poortie;" "St. Antoni's Poort;" "Regiliers Poort;" "Saaghmeulins Poortie;" dated 1636. Another ſet of four, of Dutch ſea-ports, alſo in folio; "The Four Elements," in 8vo.; a pair of "The Fauxbourg of St. Marcian;" and "The Porch of St. Bernard," at Paris; a ſea-fight with ſhips on fire, and another marine ſubject, with two ſhips engaging, all of folio dimenſions, and from compoſitions by the engraver himſelf.

Henry Snayers, or Sneyos, was born at Antwerp in the year 1612, and always reſided in his native city. Of whom he learned engraving is uncertain, but he evidently imitated the ſtyles of P. Pontius and the Bolſwerts. His prints, as is believed, are the ſole production of the graving tool; he drew correctly, and much of the character, expreſſion, and ſpirit of the original pictures after which he worked, are infuſed into his tranſlations.

When engraving after Rubens, his prints, of which the following are the beſt, bear ſtrong reſemblance to thoſe of Scheltius a Bolſwert.

The portraits of Adam Van Oort, after Jordaëns, and prince Robert, count palatine of the Rhine, after Vandyke; "The Holy Virgin and Infant Saviour appearing to St. Alanus of Rupe," a rare print, in large folio, and preſumptively after a compoſition by Snayers himſelf; "The Holy Virgin ſeated and ſurrounded by Saints," in large folio; "The Fathers of the Church debating the Queſtion of Tranſubſtantiation," of very large folio dimenſions; "St. Francis d'Aſſiſe receiving the Sacrament of Extreme Unction," all after Rubens; and "Sampſon delivered to the Philiſtines," after Vandyke, alſo in large folio.

Alexander Voet, or Voert, the younger, was a native of Antwerp, and born in the year 1613. He was probably the diſciple of Paul Pontius, whoſe ſtyle he frequently imitated, but not with any very great ſucceſs. There is a want of effect, and an incorrectneſs of outline, even in his beſt works, though engraved very neatly. He executed a conſiderable number of plates, after Flemiſh maſters, but more particularly after Rubens; the beſt of which are as follows: "Judith and Holofernes," in large folio (the earlieſt impreſſions of which are before the name of C. Galle was inſerted); "The Return from Egypt," in folio; "The Virgin and Child," to whom angels preſent a baſket of fruit, in folio; "The Martyrdom of St. Andrew," a fine print, in large folio; "St. Auguſtin," rare, in large folio; "St. Agnes with a Lamb," in folio; "Seneca in the Bath, bidding Farewel to his Friends;" "Roman Charity," both in folio; "A Satyr with Fruit," accompanied by a bacchante, in large folio, all after Rubens; "Folly," after Jac. Jordaëns; "The Card-Players," after Corn. de Vos, both in large folio; and "Chriſt bearing the Croſs," a capital print after Vandyke, engraved on three plates.

Peter Baillu, or Balliu, was born at Antwerp in the year 1614. He learned the rudiments of painting in his native country, after which he went to Italy for improvement, where, in conjunction with other artiſts, he was employed in engraving the Juſtinian Gallery. On his return to Antwerp, in the year 1635, he was much patronized, and his engravings are, by many collectors, held in no ſmall eſteem. Huber claſſes him among the firſt engravers of his age. His works exhibit ſome talent in the art of expreſſing the textures of various ſurfaces, and his chiaroſcuro poſſeſſes conſiderable force; yet his heads are ſeldom expreſſive or beautiful; and the extremities are heavy and not well marked. He engraved both portrait and hiſtory, and executed his plates entirely with the graver. Among his moſt eſteemed works are the following:

Portraits.—Louis Péreira, and Claude de Chabot, envoys to Munſter, both in 4to. without the name of the painter; John Leuber, counſellor of Dreſden, from A. van Woeſbergen; pope Urban VIII. giving his benediction; the four heads of the church—St. Jerom, St. Auguſtin, St. Ambroſe, and St. Gregory, all in folio; Jacob Backer, a painter of Holland, in 4to.; and John Bylert, a painter of Utrecht, both from his own pictures; Albert, prince and count of Arenberghe, in large folio, from Vandyke; Lucy Peraye, counteſs of Carliſle; Anthony of Bourbon, count of Morel, ſon of Henry IV.; and Honorus Urphée, count of Novi Caſtellie, &c. all in folio, from Vandyke.

Hiſtorical Subjects after various Italian Maſters.—"Heliodorus chaſed from the Temple by Angels;" a very large upright print, engraved on two plates, after a drawing by Van Lint, from Raphael's picture in the Vatican; "A dead Chriſt lying on the Knees of the Virgin Mary;" a large upright plate from An. Carraci; "The Archangel Michael overcoming the Dæmon," after Guido; "The Reconciliation between Jacob and his Brother," after Rubens, all in large folio; "Chriſt in the Garden of Olives;" "The expiring Magdalen," ſupported by angels, both in folio; The Rape of Hippodamia, or the Combat of the Centaurs and Lapithæ," in large folio, all after Rubens; "A Holy Family," after Theodore Rombout, in folio; "Mary Magdalen and St. Francis at the Feet of Chriſt;" "The Virgin in the Clouds," both in large folio, from Vandyke; "Rinaldo and Armida," in large folio, after the ſame painter (the companion was engraved by P. de Jode); "Suſannah at the Bath," after Martyn Pepyn; "The Flagellation," after Diepenbeck; "Chriſt crowned with Thorns," after the ſame painter; "The Invention of the Croſs, before St. Helena," after Van Lint; "The Emperor Theodoſius holding the Croſs before St. Ambroſe," after the ſame painter, all in large folio; "Jeſus Chriſt faſtened to a Column," attended by angels, with the inſtruments of the paſſion, after John Thomas, in folio; and "St. Anaſtaſius ſeated in a vaulted Apartment reading," after Rembrandt, a folio print, with a fine effect of light and ſhadow.

John van Aken was born in Holland, A.D. 1614, and was the fellow-ſtudent of Bamboccio. He has frequently been miſtaken for John van Aachen, of Cologne, the latter of whom did not engrave.

The following etchings, from the hand of Van Aken, are free and maſterly, and in a ſtyle much reſembling that of J. Both.

A ſet of ſix horſes, with landſcape back-grounds, in 8vo. marked J. V. Aken, fecit. M. de Heinneken likewiſe cites the two following: a landſcape, where a horſe appears in the fore-ground ſaddled, and a man ſeated on the ground behind it, with only his back ſeen, and towards the left, another man with his hat on. This is very ſcarce; and four fine mountainous landſcapes, ornamented with figures, wood, and buildings, in folio, both marked with his name, to which is added fecit; and in the latter H.L. inventore.

John Almeloven was born in Holland in the year 1614. He was a painter as well as an engraver; the latter profeſſion he exerciſed chiefly for the bookſellers, but with great credit to himſelf. His etchings, of which the ſubjects are principally landſcapes, abound with freedom and intelligence. Of theſe it may be ſufficient to mention, in this place,

The *Portrait* of Giſbert Voetius, marked J. Almeloven, inv. et fec.; a ſet of twelve views of towns and villages, ornamented with figures; a ſet of ſix mountainous landſcapes, with figures, and the four ſeaſons, from Herman Saftleven, all in quarto.

Matthew Borrekens, or Borekens, was the contemporary and friend of the preceding artiſt, and reſided at Antwerp. He worked chiefly with the graver, in a neat ſtyle, reſembling in manual execution that of P. Pontius, but his drawing is far leſs correct.

The principal parts of his works are the copies he made from Bolſwert, and other eminent engravers, for Vanden Enden, of which the beſt are as follows:

Portraits of Auguſtus Carpzou, plenipotentiary of Frederic William, duke of Saxony, Anſelme van Hulle pinxit, in folio; Gerard Schepeler, plenipotentiary of the peace of Oſnabruck, from the ſame painter; the prelate Chriſtopher Buthens, after Diepenbeck, all in folio.

Hiſtorical Subjects, &c.—"Mary Magdalen embracing the Crucifix," accompanied by the Virgin and St. John, after Vandyke, in very large folio; "The Virgin ſtanding upon a Globe, treading on a Serpent," in folio, after Rubens; "St. Francis Xavier," and "St. Ignatius of Loyola," all in folio; "St. Barbara," in large folio, a very rare print; all from Rubens. "Jeſus Chriſt bound," ſurrounded with angels bearing the inſtruments of the paſſions; "The good Shepherd," "The Myſtery of the Maſs," both in large folio; and the frontiſpiece to "Butkins's Trophies of the Duchy of Brabant," in folio; all after Diepenbeck.

Andrea Stock was born in Holland, A.D. 1616, and reſided the greater part of his life at Antwerp. He was the pupil of Jacques de Gheyn, and imitated his ſtyle with tolerable ſucceſs. His profeſſional talent was of a general nature. He engraved portrait, landſcape, and hiſtorical ſubjects, but can ſcarcely be ſaid to have riſen above mediocrity.

His beſt prints are, the *Portraits* of Albert Durer, in 4to. after Thomas Vinidor de Bologne; Hans Holbein, from a picture by that maſter, in 4to.; Lucas of Leyden, from a picture by himſelf, in 4to.; Peter Snayers, after Vandyke, in folio; "Abraham ſacrificing Iſaac," a large upright, after Rubens; "The twelve Months of the Year," after John Wildens; and a ſet of eight landſcapes, after Paul Bril, all of quarto dimenſions. Theſe, with the "Académie de l'Epée" of Thibault, which was publiſhed at Antwerp, will probably afford ſufficient ſpecimens of the various talents of this engraver.

Antonio Waterloo was born among the ſcenes which he ſo admirably repreſented, in the ſuburbs of Utrecht, in the year 1618. The events of his life are very little known, but none who have taſte and ſenſibility to appreciate his merits, can read and reflect on that little, without wonder and regret. Though born to a comfortable patrimony, and bleſſed with an excellent genius, he died in a miſerable ſtate, as is reported, in one of the hoſpitals of Utrecht, at the age of forty!

This ſeems reproachful either to ſociety or to Waterloo himſelf: but reproaches may well be allowed to ſink in ſilence, when we know not where they ought to attach. Great talent is often eccentric, and, to all but the eye of philoſophy, will ſeem to ſhoot madly from the ſocial orbit: that the undeviating ſons of Commerce ſhould turn from a bright prodigy to a barometer or a weather-cock, is perfectly natural; meanwhile the meteor glares and expires. Earth is illumined, but are the merchants enriched?

Hundreds of dealers have amaſſed fortunes, and others will for centuries continue to amaſs fortunes by ſelling the works of an artiſt of our own country, who kept ſchool in Bunhill row, and diſpoſed of his Paradiſe Loſt for almoſt nothing. Hundreds have in like manner enriched themſelves by dealing in the works of Waterloo, who languiſhed and died in an hoſpital.

"Father forgive them, for they know not what they do," is a divine prayer, which intelligent Chriſtians, in pity to ignorance, cannot too often repeat. Neither know they whom, nor what, they neglect.

Averting our attention, then, from the private life—the frail and mortal part—of this great artiſt, to works that will live and be admired as long as engraving ſhall endure, we have to obſerve, that he was rather an engraver who occaſionally painted, than a painter who occaſionally engraved; for while his plates are numerous, his pictures are very few. For an account of his merits in the latter art, the reader is referred to the article WATERLOO.

If he had any tutor in engraving, it has eſcaped record. The woods, the winding roads and villages in the environs of Utrecht, appear to have been his ſtudy, and of many of theſe his etchings are faithful portraits, rendered with a maſter's hand and poet's ſenſibility. The frankneſs and beauty of his ſtyle, ſhew that he read the book of nature with intuitive readineſs; and that the character which was occult to others, was to him eaſy and familiar.

Gilpin ſays, that "Waterloo is a name beyond any other in landſcape. His ſubjects are perfectly rural. Simplicity is their characteriſtic. He ſelects a few humble objects. A coppice, a corner of a foreſt, a winding road, or a ſtraggling village: nor does he always introduce an offſkip. His compoſition is generally good, and his light often well diſtributed; but his chief merit lies in execution, in which he is a conſummate maſter. Every object that he touches has the character of nature; but he particularly excels in the foliage of trees."

But Waterloo ſometimes compoſes ideal landſcapes of a grand and impreſſive character, though ſtill under the influence of the ſame preſiding ſimplicity. The ſcenes to which claſſic romance, or the ſublimities of holy writ have ſtimulated his imagination, appear to have been produced with as little effort, as the foreſt glades, or ruſhy and ſecluded pools, overhung with alders, or pictureſque knolls, which he doubtleſs drew and etched, juſt as he ſaw them in nature.

Of this, his "Tobias and the Angel" may ſerve as an inſtance, of which the reverend writer above quoted has, in another place, written as follows. "The landſcape I mean is an upright, near twelve inches by ten. On the near ground ſtands an oak, which forms a diagonal through the print. The ſecond diſtance is compoſed of a riſing ground, connected with a rock which is covered with ſhrubs. The oak and the ſhrubs make a viſta, through which appears an extenſive view into the country. The figures, which conſiſt of an angel, Tobias, and a dog, are deſcending a hill, which forms the ſecond diſtance. The print, with this deſcription, cannot be miſtaken. The compoſition is very pleaſing. The trees on the fore-ground, ſpreading over the top of the print, and ſloping to a point at the bottom, give the beautiful form of an inverted pyramid, which, in trees eſpecially, has often a fine effect. To this form, the inclined plane on which the figures ſtand, and which is beautifully broken, is a good contraſt. The rock approaches to a perpendicular, and the diſtance to an horizontal, line. All together make ſuch a combination of beautiful and contraſting lines, that the whole is very pleaſing. The keeping is well preſerved. The ſecond and third diſtances are both judiciouſly managed. The light is well diſpoſed. To prevent heavineſs it is introduced upon the tree, both at the top and at the bottom; but it is properly *kept down*. A maſs of ſhade ſucceeds over the ſecond diſtance, and the water. The light breaks in a blaze, on the bottom of the rock, and maſſes the whole. The trees, ſhrubs, and upper part of the rock are happily thrown into a middle tint.

"Perhaps the effect of the diſtant country might have been better, if the light had been kept down; leaving only one eaſy catching light upon the town and the riſing ground on which it ſtands.

"The execution is exceedingly beautiful. No artiſt had a happier manner of expreſſing trees than Waterloo; and the tree before us is one of his capital works. The ſhape of it we have already criticiſed: the bole and ramifications are as beautiful as the ſhape. The foliage is a maſter-piece. Such a union of ſtrength and lightneſs is rarely found. The extremities are touched with great tenderneſs; the ſtrong maſſes of light are relieved into ſhadows equally ſtrong; and yet eaſe and ſoftneſs are preſerved. The fore-ground is highly enriched; and indeed the whole print, and every part of it, is full of art and full of nature."

Theſe remarks from the pen of Mr. Gilpin, on the Tobias of Waterloo, are ſo pertinent, and ſo applicable to the generality of his works, that it is only neceſſary to add that the mode in which theſe extraordinary prints were produced, is ſimply *etching*, which he is ſuppoſed to have worked up to ſo powerful an effect of chiaroſcuro with his etching needle, by mere dint of drawing and the various preſſure of his hand, as to render all *ſtopping out* (as it is termed) of his lighter tints, unneceſſary. His plates are believed to have been *bit in* (or corroded) at one operation of the aquafortis, and not to have been touched afterward with either graver or point.

Some of the foreign writers on art, to whom we are indebted for deſcriptive catalogues of the works of Waterloo, are, however, of a different opinion, and aſſert, that after the proceſs of corroſion, he ſtrengthened and enriched his tones, and eſpecially the boles and branches of his trees, with the graver.

The preſent writer, from the compariſons which he has been able to make between various impreſſions, and his knowledge of the manner in which engraved plates wear under the hand of the printer, is inclined to believe, that the darkeſt parts of Waterloo's plates, which are generally the overſhadowed boles and branches of his trees, would of courſe begin to wear firſt, (from the ridges of copper in ſuch parts being either exceedingly minute, or entirely corroded away) and would conſequently want retouching before any other parts began perceptibly to wear, which retouching was at that time always performed with the graver, the art of *rebiting* being unknown.

Hence, in collecting the works of this maſter, it is of the utmoſt importance to attend to the goodneſs of the impreſſions; for the demand for them has been ſo great, and the plates have in conſequence been ſo frequently retouched, that the latter prints are altogether unworthy of the name of Waterloo. You ſee in them, indeed, the general forms of the objects, but every trace of the elegant freedom and ſpontaneous grace of the maſter, is irrecoverably gone: back-grounds and fore-grounds are jumbled together, and in ſome inſtances nothing is left but a few ſtrong, ſtiff, unmeaning lines on a faint and unintelligible ground.

The high eſtimation in which the works of this juſtly celebrated landſcape engraver has ever been held, have occaſioned frequent republications of his plates, and Huber, Roſt, and Adam Bartſch, of the imperial library at Vienna, have written deſcriptive catalogues of them, of which the following liſt is an abridgment. The cypher which Waterloo ſometimes affixed to his etchings, may be ſeen in *Plate* I. of the monograms, &c. of the engravers of the Netherlands.

Views and Compoſitions.—A pair, of a ruined building, and a woody receſs with two peaſants. A ſet of four, *viz.* the hermitage; the paſſage of the rocks; the little waterfall; and the mountain bridge, all in octavo. A ſet of twelve, in quarto; *viz.* the fiſherman's return; the arrival of travellers at a country inn; the ruſtic well; the village mill; the village church; the caſtle on the bank of a river; the little bridge, with three anglers; the four peaſants; view on the road to Schevelingen; the fiſherman, (a river ſcene;) the two towers, (another river ſcene); and a paſtoral landſcape, on the fore-ground of which are a goat, ram, and ewe, which Bartſch has attributed to Marc de Bye. The mill dam, and the entrance to a foreſt, a pair in quarto, are two of Waterloo's early performances, coarſely executed, and evidently done before his powers had attained to maturity. Another ſet of twelve, of which the ſubjects are, 1. The fruit trees. 2. The church-yard. 3. The cottage. 4. A view on the ſea-ſhore, on the middle ground of which is a village ſpire. 5. Another view, with two fiſhermen. 6. Another view, with cattle and figures in a boat. 7. The traveller and two trees. 8. A paſtoral ſcene, with ſheep and a ſhepherd croſſing a bridge. 9. The deſerted village. 10. The inhabited village; three peaſants are here repoſing on a fore-ground hillock. 11. The ſentry box. And 12. The ſtone bridge. Another ſet of ſix, in quarto; *viz.* 1. A foreſt ſcene, with travellers. 2. A river ſcene, called "the little bridge." 3. Sheep fording a ſtream. 4. The boys and a dog, drinking at a brook. 5 and 6, Paſtoral landſcapes, with ſhepherds repoſing under trees, &c. A pair of cottage ſcenery, in quarto, with the effects of moonlight and twilight, of the upright form. A ſet of ſix, in quarto; *viz.* 1. The rock bridge, over a mountain torrent. 2. The travellers converſing. 3. A cottage ſurrounded with trees. 4. The oak, (under which a male and female peaſant are converſing.) 5 and 6. Views from nature, with travellers and their dogs. Another ſet of ſix, of the ſame dimenſions; *viz.* 1. The hermit's chapel. 2. The loaded aſs. 3. The ſleeping peaſant. 4. The ſtreamlet. 5. The mountains. And 6. The wooden bridge. Another ſet of ſix, denoted as follows: 1. The foreſt traveller. 2. The cottage, overſhadowed with trees. 3. The entrance of a wood. 4. The gate. 5. The knotty tree. And 6. The foreſt river. Two other ſets, in quarto, of ſix ſubjects, each conſiſting chiefly of rural and foreſt ſcenery. [It is to be remarked of theſe, and of Waterloo's works in general, that while their real merits and beauties reſide in the landſcape, collectors have, with little ſenſibility or reflection, denominated them from the figures which they contain, (which are the worſt parts of Waterloo;) ſo that a grand mountain ſcene with rocks and cataracts, is ſometimes known by the ſilly title of the boy and dog, or the milk-maid.] A ſet of ſix grand landſcapes of larger dimenſions, entitled, 1. The double caſcade. 2. The caſtle and cataract, or triple caſcade. 3. Rocks and mountains, with three figures on the fore-ground. 4. A wild mountain ſcene. 5. The grand waterfall. And 6. Cottagers at the foot of a mountain. Another ſet of ſix, *viz.* the temple, with a cupola and waterfall in the middle ground. 2. The rock bridge. 3. The large tree, with four figures. 4. Huntſmen in a foreſt. 5. A paſtoral ſcene, with a ſhepherd and his flock. 6. A watermill, with a cowherd and cattle. Another ſet of ſix, in large quarto; *viz.* 1. A plain, with clumps of trees. 2. The wildfowl hunter. 3. The return from the chace. 4. The traveller by twilight, a foreſt ſcene. 5. A river ſcene, with boys bathing. 6. A foreſt glade, with figures repoſing. Another ſet of ſix, in large quarto, all of which are views from nature, chiefly of villagers, but the names of the places have not yet been mentioned. A ſet of twelve beautiful landſcapes in ſmall folio; *viz.* 1. A garden ſcene. 2. Ruins of a city, with figures and cattle on the fore-ground. 3. The two bridges, (one of which is of ſtone, and the other of wood.) 4. The caſtle and rock. 5. The two travellers. 6. The city gate. 7. A river ſcene, with two ſtone bridges. 8. A ſhepherd conducting his flock acroſs a ſtone bridge. 9. A water-mill in a wood. 10. The ſkirts of a foreſt, with a falconer and greyhounds. 11. The pointed tower, a foreſt ſcene, with ſportſmen repoſing. 12. Another foreſt ſcene, with three large trees on the fore-ground. Another ſet of ſix, in large folio, of foreſt ſcenery, with rivulets and ruſtic bridges, all of which are believed to be views from nature, of places not named. Another ſet of ſix, in large folio, and of great beauty, which are numbered and named as follows: 1. A country-inn, with pedlars reſting. 2. A champaign country, with figures in converſation. 3. A woodland ſcene, with two very ſmall figures. 4. Two trees on the bank of a ſtream, with an open gate. 5. Another woodland ſcene, viewed from a corn-field. 6. A plantation of young trees, with a ſleeping ſhepherd on the fore-ground. A ſet of ſix large upright landſcapes; *viz.* 1. The large windmill, ſo called, but the mill itſelf is at a diſtance, and the near objects are an old houſe ſurrounded with trees, and on the left a wooden chapel. 2. A woodland ſcene, with two peaſants and a dog. 3. A mountain ſcene, with a road winding over a wooden bridge, towards a foreſt. 4. A village ſcene, with a woman and children repoſing on the fore-ground. 5. The entrance of a wood, with two travellers repoſing, and a horſeman advancing from among the trees. 6. Another woody ſcene, with a church ſpire in the diſtance. A ſet of ſix compoſitions in large folio, and of the upright form, with poetical ſubjects introduced from the heathen mythology; *viz.* 1. Alpheus and Arethuſa. 2. Apollo purſuing Daphne. 3. Mercury enchanting Argus. 4. Pan purſuing Syrinx. 5. Venus and Adonis. And 6. The death of Adonis. Another ſet of ſix hiſtorical landſcapes, in large folio, with ſubjects from the Old Teſtament; *viz.* 1. Abraham diſmiſſing Hagar and Iſhmael. 2. Iſhmael languiſhing in the deſart, is comforted by an angel. 3. The death of the diſobedient prophet. 4. Tobias and the angel, upon which we have commented at length. 5. Zipporah kneeling, executing the divine commands on the ſon of Moſes. And 6. The prophet Elijah fed by ravens in the wilderneſs; all of which are very grand compoſitions, and executed in the higheſt taſte of Waterloo.

Egbert van Panderen was born A.D. 1606. He reſided, during great part of his life, at Antwerp, but he often added the word Haerlemenſis to his name, from which we may infer that he was a native of Haerlem. He worked entirely with the graver, in a ſtiff formal ſtyle; and his prints have neither harmony of effect, nor correctneſs of drawing to recommend them. The following are ſelected from thoſe moſt worthy of notice: God, an angel, a man, and the Devil, or “The Hiſtory of Sickneſs and Medicine,” from Henry Goltzius, in quarto, very rare; “The Virgin Mary interceding with Chriſt for the Salvation of Mankind,” after Rubens, in folio; “The Four Evangeliſts,” half figures, after P. de Jode; “St. Louis, Biſhop of Thoulouſe,” after the ſame painter. Part of the plates for a large folio volume publiſhed at Antwerp, 1628, entitled “Academie de l'Epée,” by G. Thibault, all of folio ſize; ſix engravings of quarto ſize, of horſes, from Ant. Tempeſta; “Maurice, prince of Orange, on horſeback,” after the ſame painter, in large folio; and “Pallas,” “Juno,” and “Venus,” after Spranger, in circles of folio ſize.

Theodore van Keſſel was born in Holland, A.D. 1620, and, it is probable, was related to the Keſſels, who were painters of no ſmall repute in that country. His works, which are rather numerous, conſiſt chiefly of etchings; and (when he did not attempt to draw the human figure,) are by no means devoid of merit, but frequently are executed in a firm and free ſtyle. He etched a ſmall folio volume of vaſes and ornamental compartments, conſiſting of eight parts, from the deſigns of ſir Adam de Viane, with his portrait at the beginning. They were publiſhed at Utrecht by his ſon, Chriſtopher de Viane; and almoſt all the plates are marked with the monogram of the inventor, formed by an A and V joined together, and the initials of the engraver's names, T. V. K. to which f. or fec. is ſometimes added: theſe initials are commonly joined together in a manner repreſented in *Plate* III. of thoſe uſed by the engravers of the Low Countries. Several of the plates for the gallery of Teniers, and alſo the following, were executed by Van Keſſel; *viz.* an etching of the portrait of the emperor Charles V. after Titian, in quarto; “St. Gregory meditating,” a half-length figure, executed with the graver, T. Wilbontius inv.; “A Repoſe during the Flight into Egypt,” after Giorgione; “Chriſt and the Woman of Samaria;” “The Woman taken in Adultery,” both from Caracci; “Suſannah and the Elders,” after Guido; “The Holy Virgin worſhipped by Angels,” after Vandyke, all of folio dimenſions; an allegorical ſubject, repreſenting “Abundance,” in large folio; the companion to which was engraven by P. de Jode, both after Rubens. A ſet of four bas-reliefs, after the ſame painter, repreſenting 1. The triumph of Galatea. 2. A Triton embracing a ſea nymph. 3. A nymph in the arms of a ſea god. And 4. A fawn ſeated near a rock, with two children and a goat. “The Hunting of the Caledonian Boar,” a large plate lengthways, is from the ſame maſter: a man wheeling a barrow of peas and beans, with a man and woman driving cows, in the back-ground. A landſcape, the companion to the preceding, into which is introduced a girl with milk-pails, both in large folio, are alſo from Rubens. A ſet of battles and ſkirmiſhes of banditti, after P. Snayers, in folio, dated 1656, muſt conclude our ſelection from the works of this engraver.

Abraham Conrad, or Conradus, was a native of Holland, and born in the year 1620. Under what maſter he ſtudied is not known. He engraved hiſtory and portraits, but chiefly the latter; many of which are from his own drawings, and prove him to have been an artiſt of conſiderable ability.

His mode of engraving is various, and free from bigotry to any particular ſtyle: ſometimes he imitated that of Lucas Vorſterman with great ſucceſs, and at others, a ſtyle ſomewhat reſembling ſome of the heads by Rembrandt, but ſtill more reſembling that which has ſince been adopted by our countryman Worlidge; employing etching, or the work of the graver, or dry needle, as occaſion appeared to him to require.

The *Portraits* of Chriſtopher Love; Jacob Triglande, a profeſſor of the univerſity of Leyden; Thomas Mourios, of Canterbury, after D. Boudringeen; and Godefroid Hotton, paſtor of the French church at Amſterdam, after H. Moirmans; generally eſteemed the very beſt of the engravings of Conrad, all of folio dimenſions.

Of his *Hiſtorical* works, “The Flagellation,” and “The Crucifixion of our Saviour,” both in folio, and after Diepenbeck, are all we are able to ſpecify.

Having already treated of the biography of Bartolomeo, ſee BREEMBERG; it remains only to mention in this place, that the ſtyle of his etchings is ſcarcely leſs maſterly and intelligent than that of his pictures. They are much ſought after by collectors, and good impreſſions are by no means common. His mark, when he did not ſign his name at length, was B. B. F. and ſometimes two B's, in the way ſhewn in *Plate* IV. of monograms uſed by the engravers of the Netherlands.

We have by the hand of this artiſt, a ſet of twenty-four landſcapes, with figures and animals, entitled “Verſchiden verfallen Gebouden,” with an etching of the portrait of the artiſt, publiſhed in octavo, and alſo in quarto. Another ſet of twelve, entitled “Antiquités de Rome.” A landſcape, marked with his cypher. “Joſeph diſtributing Corn, during the Famine in Egypt,” in large folio; and its companion, “The Martyrdom of St. Lawrence.” There are many good copies from the two laſt ſubjects, particularly thoſe etched by Biſchop.

Henry Naiwinck, Naiwyncx, or Naiwikex, of Utrecht, according to ſome authors, was the diſciple of Bartolomeo. He was a landſcape engraver of conſiderable merit: he painted alſo, and in the cabinets of the connoiſſeurs of Holland, are drawings in Indian ink by this artiſt, which are performed with much care, and alſo with feeling and taſte.

His reputation, however, was chiefly founded on his etchings of landſcape. He caught the mantle of Waterloo: he was, perhaps, ſomewhat leſs free and painter-like, but with regard to evenneſs of tones, and what is termed engraver-like execution, improved on his prototype.

His works are faithful repreſentations of Nature, and the feeling and delicacy which every where accompanies his etching-needle, has occaſioned his prints to be much ſought after both by artiſts and collectors.

Of his etchings we are only acquainted with ſixteen, of which the earlieſt and beſt impreſſions are known to dealers by their having been taken before the name of Clement de Jonghe was inſerted as the publiſher; they form two ſets in large quarto.

The firſt ſet contains, 1. A foreſt-ſcene with a fore-ground of oaks. 2. A river-ſcene with trees, &c. 3. A rocky ſcene with wood and water. 4. A mountainous landſcape with a wooden bridge towards the left. 5. Another mountainous landſcape with wood and water. 6. A canal, or river, winding through a rocky country. 7. A river-ſcene with a village church in the back-ground. 8. Trees and water, with a mountainous diſtance.

The ſecond ſet conſiſts alſo of eight ſubjects of ſimilar general character, chiefly of mountain ſcenery.

Naiwinck always etched from his own pictures or drawings, and very rarely introduced any figures into his landſcapes.

Herman Swanevelt, or Swanefeld, ſurnamed Herman (*i. e. the Hermit*), of Italy, was born at Voerden, in Holland, A.D. 1620, and died at Rome 1690. He was the diſciple of Gerard Douw, but ſoon quitted the ſchool of that maſter, and migrated to Italy, where he placed himſelf for a while under the inſtructions of Claude of Lorraine.

But like all artiſts of original powers, he was much leſs indebted to any inſtructor for his acquirements, than to his own unremitting ſtudies from nature.

The recluſe life which he led in Italy, and the long and ſolitary rambles which he took in that claſſical and romantic country, for the ſake of enjoying nature, and contemplating landſcape at its pureſt ſources, obtained for him the cognomen of *the hermit*, which, generally ſpeaking, is well ſuſtained in his works, by the retired gloom of his choice of ſubjects.

For an account of his merits as a painter, the reader is referred to the article SWANEVELT. As an engraver, he was original, bold, and free, always working from his own pictures and drawings, which are either compoſitions or views from nature, and which he enriched with figures and cattle, that for drawing and appropriate introduction far exceed thoſe of his maſter Claude.

The general characteriſtics of his landſcapes are wildneſs and ſublimity. He has more of breadth and ordonnance, or the ſtudied graces of landſcape compoſition, than Waterloo, and more of mechaniſm in his mode of execution, but leſs of fine feeling and taſte. His chiaroſcuro is grander, but he poſſeſſes leſs ſenſibility to the ſimple graces of nature when viewed in detail. Swanevelt is more ſymmetrical and wiſely arranged, Waterloo more ſpontaneous. If Swanevelt is more epic, Waterloo is more paſtoral. The latter etched what was before him without any ſeeming effort; the former went abroad to *ſtudy*, and ſtudied with effect.

The engravings of Swanevelt are ſomewhat numerous, and are much ſought after; ſo that good impreſſions are by no means common. Thoſe moſt worthy of the attention of the collector are as follows:

A ſet of eighteen rural ſubjects, with figures and Italian buildings, in ovals, entitled "Variæ campeſtri fantaſiæ a Hermano Swanevelt invent. et in lucem editæ;" a ſet of thirteen Italian landſcapes, including a dedication to Gedeon Tallement, in ſmall quarto; a ſet of twelve Italian landſcapes, enlivened with figures, and entitled "Diverſes Veuës dedans et dehors de Rome, deſſinées par Herman van Swanevelt, dédiées aux Vertueux," in quarto; a ſet of ſeven, of domeſtic animals, with landſcape back-grounds, in ſmall quarto; a ſet of four mountainous landſcapes, enriched with figures of nymphs and ſatyrs, in 4to.; four landſcapes, into which are introduced hiſtorical ſubjects, *viz.* "Abraham receiving the three Angels;" "The Angel conducting Tobit;" "Elias in the Wilderneſs comforted by an Angel;" and "The Angel encouraging Tobit to take the Fiſh," all of quarto ſize; a ſet of ſix Italian landſcapes with figures; another ſet of the ſame number, with remarkable buildings and figures; four landſcapes, in each of which the Flight into Egypt is variouſly repreſented; four views of the Apennines, with ruſtic figures, all of folio dimenſions; a ſet of four landſcapes with figures and animals, in ſmall folio; ſix landſcapes, forming a ſeries, into which the hiſtory of Venus and Adonis is introduced, in large folio; and a ſet of four wild landſcapes, with legendary ſubjects, in large folio, *viz.* "St. Jerome meditating before his Cell;" "A Satyr offering Fruit to St. Anthony in the Deſart;" "St. Anthony regaling his Friend St. Pacome;" and "The Death of the Magdalen."

Aldert van Everdingen was born at Alkmaer, in Holland, A.D. 1621, and died in the ſame city in 1675. He frequented ſucceſſively the ſchools of Roland Savery and Peter Molyn, both of whom he ſoon ſurpaſſed. During a voyage in the North ſea, he was thrown by a tempeſt on the coaſt of Norway, where he reſided upwards of twelve months, and employed his time in ſtudying the wild and romantic character of the landſcape ſcenery of that country. He etched with the ſame picturesque feeling and taſte with which, as we have already ſtated (ſee EVERDINGEN) he painted, and among his works are a ſet of one hundred ſmall views in Norway, executed with admirable variety, peculiar characteriſtic wildneſs, and as much vigour of genius as the caſcades of Tivoli, by Salvator Roſa. Moſt of his engravings are of Norwegian ſubjects, and are marked ſometimes with his initials, and at others with his name at length.

Believing that there is, in our language, no deſcriptive catalogue of the works of this artiſt, we ſhall proceed to ſpecify thoſe moſt worthy of admiration.

A pair of ſmall oval landſcapes of rural character; a pair of very ſmall uprights, one repreſenting a foreſt with four figures in the Norwegian coſtume, the other a champaign country with a cottage; four ſmall mountainous landſcapes with figures and water; four, in octavo, etched in a very free ſtyle, of cottages and figures.

Another ſet of four, in octavo, of cottages and figures; three marine ſubjects with veſſels and figures, in 4to.

Six mountainous landſcapes, with figures, trees, windmills, cottages, &c. in 4to.

A ſet of three, in quarto, one repreſenting a windmill and ſluice; the ſecond a perſpective view of a village and church; the third is of wild character, with three peaſants and a dog on the fore-ground.

A pair, in quarto, one repreſenting a mountainous ſcene with fir trees and a hermitage; the other cottages and trees, with a ſwineherd and two hogs in the fore-ground.

Two woody landſcapes, of quarto ſize, in one are rocks on the fore-ground and cottages; the other is a cottage-ſcene, with a man and woman in converſation. The four laſt are (contrary to the cuſtom of Everdingen) lengthways.

A pair of landſcapes, in quarto, of rocky character, with fir trees and figures; in the ſecond two figures are ſeated at the foot of a rock, one of whom writes on a ſtone the name of Everdingen.

A pair of mountainous landſcapes; in one of them is a wooden bridge communicating from one rock to another; the other is a ſtone bridge communicating with very lofty rocks, acroſs which a pedlar is travelling, in the middle-ground a man is ſeated, who appears to be drawing.

A pair of woody landſcapee, in quarto, with cottages; on the road towards the left hand are two figures and a horſe; the other is a rocky ſcene with trees, in the back-ground is a view of the ſea.

A pair of ditto, with the effect of night; one of them is a rocky ſcene with a cottage and figures; the other is an immenſe pile of rocks crowned with wood, all of quarto ſize.

A pair of ditto, one of which repreſents a monument; the other a cottage and peaſants.

A pair of ditto, one is a farm-yard with poultry and figures; the other conſiſts of piles of various trees cut down for building, with two peaſants, all in quarto.

A foreſt ſcene, a river is winding through the fore-ground, over which an old oak ſpreads its horizontal arms. Of this engraving there are two ſets of impreſſions, one being leſs than the other by a third part.

A woody ſcene with cottages and figures, in the fore-ground is a waterfall with figures angling.

A beautiful caſcade formed down the ſide of a mountain by water which turns a mill; towards the right a peaſant is ſeated on the ſtump of a tree.

A large wooden bridge with a peaſant croſſing it; in the middle diſtance is a cottage and church ſpire, with a perſpective view of a town.

A mountainous landſcape with a watermill; on the fore-ground are three figures.

A mountainous ſcene; on the middle plain is a cottage with oaks and fir trees.

A landſcape ornamented with very taſteful figures; towards the right is a monument in the antique ſtyle, with columns of the Doric order.

And a landſcape, on the fore-ground of which is a Gothic temple, towards which a great number of figures of both ſexes are crowding; towards the right is a chapel ſurmounted with a ſtatue of St. Nicholas, all of large quarto ſize.

Theſe laſt eight prints are the moſt capital of the engravings of Everdingen. He likewiſe publiſhed a ſet of one hundred views in Norway, and a ſet of fifty-ſix octavo plates, from his own deſigns, from a book entitled "The Tricks, or Deceits of the Fox," which was written by Henry d'Alkmaer.

Nicholas Lauwers was born at Leuſe, in Hainault, in the year 1620, but eſtabliſhed himſelf and publiſhed his engravings at Antwerp. He emulated the merits of the ſchool of Rubens, and, as Strutt thinks, ſtudied under Paul Pontius, whoſe ſtyle of engraving he for the moſt part imitated, working with the graver alone. He was, however, by no means equal to that great maſter, either in his knowledge of forms, powers of delineation, or excellency of handling.

Lauwers engraved after ſeveral of the Flemiſh maſters, but his beſt prints are decidedly thoſe which are from the pictures of Rubens, of which the chief are as follow.

"The Adoration of the Eaſtern Kings," of the upright form; "The Ecce Homo," of the ſame form. (*Note.*—In the latter impreſſions of this plate, the name of Lauwers is eraſed, and that of Scheltius a Bolſwert ſubſtituted in its ſtead, which is probably the trick of ſome Dutch dealer, which has been put in execution, in order to enhance the nominal value of the impreſſions.) "The Deſcent from the Croſs," of the ſame form, and "A Dead Chriſt on the Lap of the Virgin Mary," all of folio dimenſions. "The Triumph of the New Law" is a very large and fine print, lengthways, which Lauwers has engraved on two plates, and is alſo after Rubens, as well as his portrait of Iſabella, infanta of Spain.

There are, however, ſome few exceptions to our general aſſertion that the beſt works of this maſter are after Rubens. His large print of "Baucis and Philemon entertaining Jupiter and Mercury," (which Strutt has miſtakenly attributed to his brother Conrad,) is after Jordaëns, and may certainly be claſſed among his very beſt productions. His "Holy Virgin and Child," and "St. Agabus," after Diepenbeck, and his "St. Cecilia," and "Interior of a Cabaret," after Seghers, have alſo conſiderable merit.

Conrad Lauwers was the elder brother of Nicholas, and worked much in the ſame ſtyle, with the graver only, but with ſomewhat inferior powers. He was born at Leuſe in the year 1613, but reſided principally at Antwerp.

The *Portraits* of Aërtus Quellinus, an architect, after J. de Decyts; Peter Verbrugghen, a ſculptor, after E. Quellinus; Marius Ambroſius Capello, biſhop of Antwerp, after Diepenbeck; and Father Antony Vigier, after J. Coſſiers, may be reckoned among the beſt works of Conrad. And his *Hiſtorical* prints of moſt reputation are, "The Prophet Elijah viſited by an Angel in the Deſart," a large upright folio; and "Chriſt bearing the Croſs," both after Rubens; "The Baptiſm of the Emperor and Empreſs of Monomotapa;" "The Great Crucifixion," after J. Coſſius, in large folio; and "The Holy Family," in a landſcape after Schiavone.

Coryn or Querin Boel, deſcended from Cornelius, and was related to Peter Boel, the painter. Probably, as there is only three years difference in the dates of their birth, he was the elder brother of the latter.

Coryn was born at Antwerp in the year 1622. He went to Bruſſels to work for the publication which is commonly called the Gallery of Teniers, which was produced under the patronage of the archduke Leopold. He worked with the graver and etching needle, but chiefly with the latter, his ſtyle of handling which, was coarſe, heavy, and by no means correct with regard to the forms of his objects.

Yet he had the addreſs to ſelect good originals to engrave from, and his works are *therefore*, we preſume, held in ſome requeſt. The moſt important of theſe are, "The Eagle of Jupiter tranſporting Ganymede through the Air," after Michael Angelo; a landſcape after Giorgione, in which are introduced a knight armed with a poignard kneeling before a female; "The Adoration of the Shepherds," after Titian; "Adam and Eve ſitting within an Arbour of Paradiſe," after Paduanino; "Venus and Adonis," after Schiavone; "The Rape of Europa," after Titian; "The Reſurrection of Lazarus," after the elder Palma; "Diana and her Nymphs bathing," after the ſame; "Perſeus delivering Andromeda," after Domenico Fetti, all of folio dimenſions. And, after Teniers the elder, "The Barber-ſurgeon Apes," and "Cats performing a Concert;" "The Village Fête," with Dutch peaſantry playing at nine pins; "The Interior of a Flemiſh Cabaret," with a joyous company of drinkers and ſmokers, all in folio; and a pair of 4to. ſize, of half-length figures of Dutch peaſantry.

Wallerant Vaillant, (who is ſlightly mentioned in our account of ENGLISH *engraving* as the coadjutor of prince Rupert,) was born at Liſle, in Flanders, A.D. 1623, and died at Amſterdam in 1677. He was the eldeſt of five brothers, who all of them attained ſome reputation in the arts. Wallerant went to Antwerp, and ſtudied under Eraſmus Quellinus; he excelled in portrait painting, and met with great encouragement; for having ſucceſsfully painted the portrait of the emperor Leopold, his occupation increaſed ſo rapidly that he ſoon acquired a competent income. He accompanied the Maréchal de Grammont into France, where he completed his fortune, and after a ſtay of four years returned to the Netherlands, and ſettled at Amſterdam. He was an engraver of merit, particularly in mezzotinto; and made ſome conſiderable improvement in that branch of art, but the grounds of his plates, when compared with modern productions in mezzotinto, were indifferently laid, and the lights uneven, particularly where they were much ſcraped. The moſt important of his works are as follow.

Portraits and Subjects from his own Deſigns.—His own portrait, and that of his wife, in oval borders, both in folio; prince Rupert; another half-length of prince Rupert, reading, both in 4to.; John Frobenius, a printer of Baſle, after Holbein, in folio; ſir Antony Vandyke, ſeated, in large folio; Siniac, a miniature painter, in ſmall folio; Hardouin de Pereſix de Beaumont, archbiſhop of Paris; Cornelius Stadus, rector of the Gymnaſe at Amſterdam; Conrad Hoppe, a reformer of Amſterdam; a young man ſeated, reading, ſuppoſed to be the portrait of Andrea Vaillant, (a fine and rare engraving); Baarent Graat, a painter of Amſterdam, all of folio dimenſions, (the firſt impreſſions of the latter plate were printed in brown;) Humphredus Henchman, epiſc. Lond. "An old Woman ſhewing a Letter to a young One;" "A young Man returned from Hunting, with a Hare and Wild Fowl," both in large folio; "Our Saviour kneeling, ſurrounded with Angels bearing the Inſtruments of his Paſſion," in 4to.; "St. Chriſtopher carrying the Infant Chriſt acroſs an Arm of the Sea," with the effect of night, in large 4to.; Leopoldus, Dei gratia. Roman; Joannes Philippus, Mogunt; Carolus Ludovicus, comes palat. Rheni et elect.; and Sophia, comit. palat. Rheni, all in folio; theſe four laſt portraits are executed with the graver, and are very rare.

Hiſtorical, &c. after various Maſters.—"St. Barbara," a half figure, after Raphael, in 8vo.; "Judith," after Guido, in large folio; "The Holy Family," after Titian; "The Temptation of St. Anthony," after C. Procaccini; buſt of a warrior, after Tintoretto; "St. Jerome," after a picture by Jac. Vaillant, all of folio ſize; "Venus lamenting the Death of Adonis," in large folio, from Eraſmus Quellinus; a group of three figures, after Terburgh, in folio; "A young Man painting at his Eaſel," after Metzu; "Two Boys," after Fr. Hals; "A Child careſſing a Dog," after Vandyke; "A Peaſant and his Wife," after Teniers; "The Prodigal Son," after Marc Gerard; "A Party of Gamblers," after the ſame painter; "Judith," and "Jael," from Gerard de Laireſſe; "A Party of Peaſants," one of whom is ſmoking, from Corn. Bega; "A Company of Peaſants," with a woman and child, after the ſame painter; "A Party of Peaſants ſinging," from Ad. Brouwer; "Two Peaſants ſmoking," from the ſame painter; "A Trumpeter Pigeon, delivering a Letter to a Lady," after Wil. Mieris; and "The Gold Weigher," after Rembrandt, all of folio dimenſions.

Bernard Vaillant was born at Liſle, and was the pupil of his brother Wallerant, whom he accompanied in his travels to Frankfort and to Paris. He gained conſiderable reputation as a crayon painter, and ſcraped ſome of his own compoſitions and portraits in mezzotinto, which he ſigned with his initials. Among them are the

Portraits of John Lingelbach, from Schwarz; Paul Dufour, after a picture by his brother; Eſaias Clement, miniſter at Rotterdam; Charles de Rochfort, miniſter of the French church at Rotterdam; Paul Duſon, a preacher at Leyden; and heads of St. Peter and St. Paul, all from his own drawings.

Andrea Vaillant was the youngeſt of the five brothers, and ſtudied engraving at Paris, after having learned the elements of art of his eldeſt brother. He engraved but few plates, among which are the portraits of Aloïſius Berilaqua, patriarch of Alexandria, in large folio; and John Erneſt Schraden, inſpector of the Gymnaſium at Berlin, in 4to.

Francis Pooſt was born at Haerlem in the year 1624, and learned the elements of art of John Pooſt a painter on glaſs. In 1647 he went in the ſuite of prince Maurice of Naſſau to America, where he reſided for ſome years, employing a large portion of his time in painting and drawing from nature. After his return to the Low Countries, he made a conſiderable number of etchings, in a maſterly ſtyle; among which is a ſet of views of Brazil, from his own drawings; "View of the Gulf of All Saints in America;" "View of Cape St. Auguſtin;" and "A View of the Iſland of Thamaraca," all in large folio; the three latter are very capital engravings, and are now become rare.

Cornelius Coning, or Koning, was born at Haerlem, A.D. 1624. He is among thoſe artiſts who are but little known, and who deſerve to be known better. We have ſome portraits of the illuſtrious men of the ſixteenth century, engraved by him in a firm and pleaſing ſtyle; but can only ſpecify the following few; Laurent Coſter, the printer of Haerlem, from J. V. Campen; Martin Luther, the reformer, both in large folio; Dierk Philius, theologian; Menno Simons; and Adrianus Tetrodius, of Haerlem, from P. Grebber; and ſome of the princes of Frieſland, after Andiceſſin, which we are not able to detail, all in folio.

Bernard Baleau, or Baillu, or Van Balen, was a native of the Low Countries, who flouriſhed at Rome during the latter half of the ſeventeenth century, but the events of his life are obſcure, and we are not acquainted with his birthplace; he worked entirely with the graver, in a heavy ſtyle, and his portraits, which are the chief of his works, have no great ſhare of merit, either with reſpect to drawing, or the execution of the engraving. The following are the moſt important.

Portraits of cardinal Urſini, who was choſen pope in the year 1672; Canute, king of Denmark, after C. Panig; "Our Saviour between St. Alcanta and Mary Magdalen," from Lazaro Baldi; "St. Mary Magdalen de Pazzio," from the ſame painter, all of folio ſize; "St. Peter of Alcantara, to whom the Virgin and Infant Saviour are appearing," from the ſame maſter; and the five ſaints canonized by Clement X. *viz.* "St. Cajetan;" "St. Francis Borgia;" "St. Philip Benitius;" "St. Louis Bertrandus;" and "St. Roſa, with the Infant Chriſt," all in large folio, after Ciro Ferri. This artiſt likewiſe engraved many of the plates for a work intitled "Effigies Cardinal. nunc viventium."

Paul Potter, the very celebrated painter and etcher of animals and landſcape, was born at Enkhuiſen in the year 1625. He was the ſon and diſciple of Peter Potter, a painter of inconſiderable talents, but is far leſs indebted for his extraordinary attainments to his father's inſtructions, than to his own aſſiduous ſtudy of nature. No artiſt has ſhewn more ſenſibility to the beauties of rural landſcape ſcenery, or more eaſy and thorough knowledge of the forms and colours of thoſe animals which conſtitute its moſt brilliant ornament; the ſtyle of none is more ſimple, original, and unſophiſticated; the genius of none ſhone with a brighter ray, for the ſhort day of his glory, over the paſtoral and domeſtic ſcenery of his native country. He died at Amſterdam A.D. 1654, at the early age of twenty-nine years.

The works of Paul Potter are held in very high eſtimation. His etchings are greatly and juſtly admired for the taſte, ſpirit, and ſimplicity of ſtyle which are diſplayed in them ; and collectors often pay large ſums for fine impreſſions of them.

His prints are original works, *i. e.* done immediately from his own compoſitions and ſtudies from nature, and are not numerous. But we are uncertain whether or not the following ſhort liſt contains the whole of his engravings.

A ſet of five, in ſmall folio, of various horſes, with landſcape back-grounds. A ſet of eight, in quarto, of cows and bulls, &c. A mountainous landſcape, with a peaſant driving cattle, a very fine and rare print, in folio. Another very beautiful landſcape, in which a ſhepherd, ſurrounded by his flock, is playing on his pipe, alſo of folio dimenſions ; and a ſet of ſmall plates of plants and flowers.

Nicholas Ryckmans, or Richmans, was born at Antwerp in the year 1620. He was probably the diſciple of P. Pontius, whoſe ſtyle he imitated, or rather tried to imitate. He worked with the graver only, in a neat but ſtiff manner, and the outlines of the naked parts of his figures (the extremities eſpecially), are exceedingly incorrect. The following are among the beſt of his works, which the merit of Rubens, rather than his own, have recommended to public notice. “The Adoration of the Wiſe Men,” from Rubens, in large folio ; the firſt impreſſions of which are prior to the inſertions of the addreſs of either Gaſper Huberti, or Corn. van Merlen. “The Entombing of Chriſt ;” “A Head of Chriſt ;” and “The Holy Family,” very rare, all in folio ; “Ulyſſes diſcovering Achilles at the Court of Lycomedes,” in large folio ; “Our Saviour and his Thirteen Apoſtles,” half figures, on a ſet of fourteen leaves, in quarto, all after Rubens : and a work, intitled “Palazzi di Genova, raccolta e deſignati da P. P. Rubens.” It is divided into two parts, repreſenting the plans, elevations, and ſections of the principal palaces and churches at Genoa : the firſt part contains ſeventy-two plates, and the ſecond ſixty-ſeven. It was firſt printed at Antwerp in 1622, and reprinted in 1652, and is of large folio dimenſions.

Cornelius van Caukerken was born at Antwerp, A. D. 1625, where he eſtabliſhed a print-ſhop of reſpectability, and engraved ſeveral plates from Rubens and other maſters. He worked entirely with the graver, in a heavy, laboured ſtyle, without much taſte. He uſually croſſed his ſecond ſtrokes ſquarely upon the firſt, which mode of engraving requires more exquiſite handling of the graver than Caukerken poſſeſſed, to render the effect agreeable. His lights are generally too much covered ; and his drawing is very defective. However, ſome of his beſt prints are by no means devoid of merit : among which number the following may be reckoned.

Portraits.—Peter Snayers, of Antwerp, from Van Heil ; Tobias Verhaect, a landſcape painter, from Otho-vænius ; Peter Meerte, a portrait painter of Bruſſels ; Robert van den Hoeck, a painter of camps, from Gonzales Coques ; John de Carandolet ; Francis de Faino, baron de Jamajo ; Charles van den Boſch, biſhop of Bruges, in an oval, without the names of the painters, all of quarto ſize ; and Charles II. of England, with a back-ground by Hollar, in large folio.

Hiſtorical, &c. after various Maſters.—“A dead Chriſt lying on the Ground, with his Head on the Lap of the Virgin,” after Caracci ; “A dead Chriſt, ſupported by the Holy Virgin and St. John,” after Vandyke ; “The Deſcent of the Holy Spirit ;” “Charity with three Children,” both from the ſame painter ; “Roman Charity,” after Rubens, a plate much to be preferred to the other engravings of Caukerken, and of which it is uncommon to find good impreſſions ; “St. Anne and the Virgin,” after Rubens, in folio, a rare print ; “The Martyrdom of St. Lievin,” biſhop of Ghent, after Rubens, in large folio (thoſe impreſſions are the beſt with the addreſs of Hollander) ; and “A Female ſuckling a Child,” in folio, from Ab. Diepenbeck.

Philip Fruytiers was born at Antwerp in the year 1625. He was originally an oil painter, but afterwards preferred water-colour, and greatly excelled in miniature painting. His works chiefly conſiſt of portraits and converſations, which he executed in a very maſterly ſtyle. His heads are very expreſſive, and his draperies well drawn. Rubens was ſo much pleaſed with this painter, that he and his family ſat to him ; and the picture of them, which he painted, was conſidered as his maſter-piece.

Fruytiers likewiſe excelled in etching, which he performed in an intelligent ſtyle, worthy of a great painter ; and generally produced powerful effects of chiaroſcuro. His engravings are not numerous, nor are we able to ſpecify more than the following

Portraits of Godofredi Wendelini, a philoſopher of the ſeventeenth century, in folio ; Marcus Ambroſius Capello, biſhop of Antwerp ; Jacob Edelherr of Louvain, both in large folio ; Hedwige Eleonora, queen of Sweden ; and an emblematical ſubject on the birth of the Virgin, in folio, all from his own pictures.

For an account of the merits of John Fyt as a painter, ſee vol. xvi. part ii. He flouriſhed at the period which is now under our review, and etched ſome few plates of animals with his accuſtomed feeling and vigour, of which the following is a liſt. A ſet of eight, in quarto, of various animals. And a ſet of ſeven, compriſing the title, with a dedication to Don Carlo Guaſco, marcheſe di Solerio, &c. &c. of dogs, with landſcape back-grounds, in ſmall folio. Few painters have produced etchings in a more feeling and animated ſtyle than this ſet is executed.

Henry Bary was a native of Holland, born A.D. 1626. His ſtyle of engraving ſeems to have been formed from ſtudying the prints of Cornelius Viſſcher ; and the imitation appears moſt evident in his portraits ; eſpecially thoſe which he has executed in his neateſt manner. In drawing, taſte, and harmony of chiaroſcuro, he is frequently deficient ; yet ſometimes he has diſcovered much mechanical ſkill, and ſeems to have handled his graver with facility. One of his beſt and moſt finiſhed prints is “Spring and Summer,” perſonified by two children, a ſmall upright plate, from Vandyke, and executed as a companion to the “Autumn and Winter,” engraved by Munichuyſen, after G. Laireſſe. This plate is executed entirely with the graver, in a clear neat ſtyle, and ſhews his management of that inſtrument in the moſt ſtriking light. Among the beſt of his remaining engravings are the following.

Portraits without the Names of the Painters.—Dirk and Walter Grabeth, painters on glaſs ; Adrian Heerebond, a philoſopher ; Hieronymus van Bevernink ; Didier Eraſmus of Rotterdam, all of quarto ſize ; Wilhelm Joſeph, baron of Ghent, and admiral of Holland ; Rombout Hagerbeets, both in folio ; Anitius Manlius Severinus Boetius, in quarto ; Jacobus Taurinus ; the count John of Waldſtein, both in folio ; and the ducheſs de la Valiere, in large folio.

Portraits ſigned with the Names of the Painters.—Hugo Grotius, after Michael Janſon Mireveldt ; Cornelius Ketels, the painter, from a picture by himſelf, both in quarto ; Jacob Backer, the painter, after G. Terburgh, in an oval of folio ſize ; John Schellhammer, miniſter of Hamburgh ; John Zas, a reformer of Gouda, from Chr. Pierſon ; Jacob Batelier ; and Arnold Guſtermans, from Weſterbaen, all in folio ; Michael de Ruyter, the Dutch admiral, after F. Bol ; admiral Vlugh, after B. vander Helft, both in large folio ;

Leo van Altzema, a Dutch hiſtorian, after J. de Banc, in large folio; and George de Mey, a celebrated theologian, after Coan Diemen, in folio.

Hiſtorical, &c.—"Neptune," a quarto plate, engraved from Bary's own compoſition. An allegorical title page to a work by Leo van Aitzenea, after Seemer, in folio. A woman ſuckling an infant, without the painter's name, and perhaps deſigned by himſelf. A pair of peaſantry, in quarto, after A. Brouwer; the country houſe-keeper, after P. van Aerſten, in folio. A pair, intitled "Take Care of the Water!" and "Wine makes the People inſolent," after F. Mieris, each inſcribed alſo with four Dutch verſes, in folio; and "A Youth dreſſed in a Hat and Feathers," after G. Terburgh, alſo in folio.

John Munnickhuyſen, or Munichuyſen, was a native of Frieſland, born A. D. 1636. He reſided at Flanders, and executed a conſiderable number of meritorious works with the graver, among which are the following

Portraits of Hendrick Dirckſen Spiegel, a burgo-maſter, a very fine engraving, from J. M. Limburg; Francis Burmann, profeſſor of theology at Utrecht, from C. Maas; Gerard Brandt, preacher at Rotterdam, from M. Muſcher, all in folio; Peter Zurendonk, rector of the Latin ſchool of Amſterdam, from David Plaats, in large folio; John van Wayen, preacher at Middleburg; Daniel Gravi, a clergyman of the ſame place, from Z. Blyhof, both in large folio; Peter van Staveren, a clergyman of Leyden, from Wilhelm van Mieris, in folio; admiral Van Tromp, of Holland, a fine portrait, from D. A. Plaſſe, in large folio; and the companion to Bary's "Spring and Summer;" repreſenting "Autumn and Winter," perſonified by children, after Vandyke.

Hercules Zeghers, or Zegers, was born at Utrecht in the year 1625. He is ſpoken of by the author of "Lives of the Dutch Painters, &c." (Deſchamps), as having been an artiſt of fertile invention, but an unfortunate exemplification of the ſcriptural text, that "the race is not to the ſwift, nor the battle to the ſtrong, nor riches to men of underſtanding, nor favour to men of ſkill."

He both painted and engraved landſcape. The above writer ſays, that his compoſitions are very rich, and much varied; and that he commonly repreſented very extenſive ſcenes, with far diſtant horizons, but met with no patronage or encouragement. Nor was he a whit more fortunate, in this reſpect, in his etchings, which ſoon iſſued forth from the retail ſhops, as wrappers to other commodities.

The preſent writer has not ſeen any of the works of Zeghers, and is inclined to think that Deſchamps may have overrated his merits. It is not eaſy to believe that at Utrecht, in the ſeventeenth century, good prints would have been depreciated to the value of waſte paper; or if a ſolitary inſtance or ſo, of ſuch depreciation had occurred, that very circumſtance would have advanced meritorious engravings to ſome public notice, which muſt have led towards appreciation, and have finally benefited the artiſt, however obſcure, in ſpite of the crafty practices of the print-dealers.

That Deſchamps was not very obſervant as a connoiſſeur, nor very correct as a writer, may be inferred from his ſtatement, that Zeghers *diſcovered* the *ſecret* of printing in colours upon *canvas:* where, for diſcovered the ſecret, we ſhould read, had recourſe to the expedient; and for canvas, according to the baron Heinneken, we ſhould read paper.

The concluding anecdotes related of this artiſt are probably more worthy of credit and of regret. Hercules made a laſt, and, according to Deſchamps, a ſtupendous effort, ſparing neither time nor pains, nor any kind of exertion of which he was capable, and produced an admirable landſcape, of which he offered the engraved plate for ſale to a print-dealer. The dealer adviſed him to convert his plate into ſnuff-boxes; and the artiſt heard with indignation that he would purchaſe it at no higher rate than the value of the copper. Zeghers took back his landſcape, and, vowing that each impreſſion ſhould ſell for as much as the dealer had offered for the plate, deſtroyed his engraving in a paroxyſm of diſappointment. The artiſt thus verified his vow, and the dealer loſt his bargain; but two proofs had been taken from the plate, and they were purchaſed at the price of ſixteen ducats each.

Nothing certain, however, can be inferred from this anecdote, without ſeeing one of the two impreſſions from the plate, or hearing ſome more faithful report of its merits than Deſchamps appears to have been qualified to give; ſince we know not who were the purchaſers: and the ignorant part of the tribe of collectors, will often freely give thoſe ſums for rarity, which they withhold from meritorious exertion.

Unable longer to endure the ſcorn and the neglect with which he was treated by the dealers and the public, this unfortunate artiſt addicted himſelf to drinking; and, one day returning to his houſe in a ſtate of intoxication, fell down ſtairs, and ſo materially injured himſelf that he died in a few hours.

It is almoſt ſuperfluous to add, that the works of Zeghers are very ſcarce. In the public hall at Dreſden are fifteen of his pictures; and another is mentioned by Houbracken, vol. ii. p. 136.

Gerard Valck, the ſervant, and afterwards the brother-in-law, of Bloteling, was born at Amſterdam in the year 1626. But both theſe artiſts migrated to England; and the reader will find an account of them, and their works, in our account of the *Origin and Progreſs of* ENGLISH *Engraving*.

Cornelius van Dalen the younger was born at Antwerp in the year 1626. He was the ſon of a print-ſeller of the ſame baptiſmal name, and, out of diſtinction, always added the word junior to his name. He is ſaid to have learned engraving of Cornelius Viſſcher; but his ſtyle varied from time to time, reſembling, as occaſion appeared to him to require, thoſe of Lucas Vorſterman, P. Pontius, S. Bolſwert, and other maſters. A ſet of antique ſtatues, engraved by him, are in a bold, free ſtyle, as if founded upon that of Goltzius: others, again, ſeem imitations of that of F. de Poilly. In all theſe different manners he has ſucceeded; and they manifeſt the extraordinary verſatility of his powers, and great command he had of the graver: for he worked with that inſtrument only.

He engraved a great variety of portraits, ſome of which are very valuable, and form the beſt, as well as the larger part of his works. He did not ſucceed ſo well in drawing the naked parts of the human figure: his outlines are heavy, and frequently incorrect; and the extremities, the feet eſpecially, are ſeldom well marked. The following are ſelected from his beſt engravings:

Portraits.—Queen Catherine of Medicis, ſeated, a very fine engraving, in large folio; Francis Deleboe Sylvius, a phyſician, C. V. Dalen del.; John Ruppert van Groenendyck, the burgomaſter of Leyden; Jacob Baudes Heertoot Waſſenaer, lieutenant and admiral; the old, old, very old man, Thomas Parr, aged one hundred and fifty-two, all of large folio ſize; Eſaias Dupré, the theologian, from D. Baudrigeen; Anna Maria Schierman, with ſix Latin verſes, after Van Ceulen; Andrea Rivetus, profeſſor of theology; Frederic Spanheim, from Van Negre, profeſſor of theology, all in folio; James, duke of York and Albany, from Sim.

Luttichuys; Charles II. of England, companion to the preceding, from the ſame painter; John Maurice, prince of Naſſau, after Gov. Hinck; Maarte Harpertſz Tromp, the Dutch admiral, after Livens; four very fine portraits, after Titian, from the cabinet of Reynſt, *viz.* Peter Aretine, John Boccace, George Barberelli, and Sebaſtian del Piombo, all of large folio dimenſions.

Hiſtorical, &c.—"The Adoration of the Shepherds;" "The Virgin and Infant Chriſt," both in 4to.; an allegorical engraving, repreſenting a ſatyr leading an aſs, and a woman and child lying near a cock, in 4to.; "The four Fathers of the Church," after Rubens, in folio, executed in the ſtyle of P. Pontius; "The Graces embelliſhing a Statue of Nature," after the ſame painter, a large upright print on two plates. In the execution of this print, he ſeems to have had an eye to the neater works of S. Bolſwert. "A Shepherd crowning a Shepherdeſs with Flowers," after Caſtelyn, in 4to.; "The Holy Virgin preſenting the Breaſt to the Infant Chriſt," after Hinck; "Venus and Cupid;" and a head of a negreſs, both from the ſame painter, all in folio; "The four Elements," repreſented by children, in ovals of quarto ſize; a concert of four perſons; "Giorgione," in large folio, from the cabinet of Reynſt; and "The Monument of Admiral Van Tromp," after a marble group by Verhulſt, a very rare print, in large folio.

Nicholas van Hoie, or Van Hoy, was born at Antwerp in the year 1626. He was but an indifferent engraver; but, at the death of Francis Leux, was entitled cabinet painter to the emperor of Germany. In conjunction with Steen, Offenback, and other artiſts equally indifferent with himſelf, he engraved the collection of pictures, which D. Teniers the younger made for Leopold, archduke of Auſtria. This collection was publiſhed at Antwerp in the year 1660, in folio, conſiſting of two hundred and forty-three prints, and is uſually known by the name of the Gallery of Teniers. The following engravings are likewiſe by him: "The Virgin and Holy Infant, with St. Jerome," after Baroccio, in 4to.; "Chriſt and the Woman of Samaria," after Raphael; "The dead Body of Chriſt extended on the Earth, and the Virgin proſtrate before it," from D. Fetti; and "Apollo and the Muſes on Mount Parnaſſus," after Tintoretto, all of folio ſize.

Richard Collin was born at Luxembourg in the year 1626. He went to Rome to ſtudy under Sandrart, from whoſe drawings he engraved ſeveral plates. He afterwards returned to Antwerp; from whence removing to Bruſſels, he was honoured with the title of engraver to the king of Spain. But in his engravings he ſeldom exceeded mediocrity. There is a portrait of this artiſt, with a long inſcription in bad French. The following are ſome of his beſt engravings:

Portraits of Artus Quellinus, a ſtatuary of Amſterdam; John Philip van Thielen, a flower-painter, both from E. Quellinus, in 4to.; Joachim Sandrart; Cornelius Hazart, a controvertiſt, both in folio; Bartholomew Murillo, the celebrated painter of Spain; Chriſtian Albert, biſhop of Lubeck, both in large folio; Anna Adelhildis, uxor principis de la Tour et Taxis; Claude Francis de la Viefville, abbé of Louvaine, in large folio; Arnold John Philip de Raet van Voont, knight of the order of Chriſt; and the thirty portraits of the ſaints of mount Carmel, all in large folio.

Hiſtorical, &c.—"Eſther before King Ahaſuerus," in large folio, from Rubens; "Chriſt carrying the Croſs," after Van Diepenbeck, in folio; "St. Arnold," after the ſame painter; and "The Sepulchral Monument of Peter Paſqual," both in 4to.

Francis van Neve, or de Neve, was born at Antwerp, A.D. 1627. He ſtudied the works of Rubens and Vandyke, and afterwards travelled to Italy. He became a landſcape-painter of conſiderable merit, and ſucceeded remarkably well in introducing ſmall figures into his pictures.

On his return to his native city, Van Neve etched a conſiderable number of landſcapes, into which he introduced hiſtorical figures with much judgment. They are executed in a ſlight, but intelligent ſtyle; the effects are very agreeable, and they are all from his own compoſitions, proving at once the excellency of his taſte, and the fertility of his genius. The following are ſelected from his works, as being the moſt meritorious.

A pair of mountainous landſcapes with buildings, and figures in the coſtume of the Grecians; a pair of landſcapes of the ſame character, with an angler and two other figures in one, the other has a large tree and a river in the fore-ground, and a man tending ſheep at a diſtance; a pair of paſtoral landſcapes, with figures in the dreſs of Arcadian ſhepherds; a pair of landſcapes, into one of which is introduced Diana and Endymion, and in the other Venus and Cupid; and another is Venus repoſing on the banks of a river, and Cupid ſwimming in it; a pair of hiſtorical landſcapes, in one of which is Narciſſus admiring himſelf; and the other is a paſtoral ſcene, with a ſhepherd playing the tabor, accompanied with his flock; all of folio dimenſions.

Henry Verſchuring was born at Gorcum in the year 1627. He learned the rudiments of art under Theodore Govertz, whoſe ſchool he quitted to ſtudy under John Both. From Utrecht, where Both reſided, he went to Rome, where he frequented the public academy, and travelled ſucceſſively to Florence and to Venice. In 1655 he returned to his native country, where he painted battles, ſkirmiſhes, and ſubjects of that kind, with great ſucceſs; he always imitated nature with much truth, and his compoſitions abound with wild variety and characteriſtic ſpirit.

Verſchuring executed a conſiderable number of ſlight etchings of ſkirmiſhes, military ſurpriſes and purſuits, from his own compoſitions, of which the preſent writer is unable to ſay more than that they are very ſcarce.

This artiſt was drowned in a tempeſt at ſea, on the twenty-ſixth of April, 1690.

John or Joſhua Offenbeck was born at Rotterdam in the year 1627, and became a landſcape and cattle-painter, whoſe merits will be treated under the article Ossenbeck.

He travelled ſucceſſively, either for patronage or improvement, to Frankfort, Mayence, Ratiſbon, and Vienna, and in the courſe of his profeſſional career, executed a conſiderable number of etchings in a free and painter-like ſtyle. Huber thinks they are the production of his leiſure, but it may fairly be preſumed that at leaſt thoſe which he executed for the gallery of Teniers were done as much for profit as for pleaſure.

Among theſe are "The Death of the Children of Niobe," after Palma; "The Children of Iſrael gathering Manna in the Deſart," after Tintoret; "Orpheus charming the Brutes," and "The Four Seaſons," all after Baſſan, and of folio ſize. Offenbeck is thought to ſucceed better in etching after the pictures of Baſſan, than thoſe of any other maſter, and the laſt-mentioned are among his very beſt prints.

For other publications he produced two ſets, of twelve quarto plates each, from his own compoſitions, of which one ſet conſiſts chiefly of animals; "A View of the Campo Vaccino," at Rome, and "The Caſarella, near the Gate of St. Sebaſtian," in the ſame city; "A Boar-hunt," after Bamboccio, and the chateau of M. de Wenzelbourg, drawn preſumptively by himſelf, all of folio dimenſions.

A ſet of ſix large upright folio etchings, entitled "The Gallery of Wenzelbourg," and after Salvator Roſa, Peter de Laer, and St. Vlieger, are of great variety; and "The Repreſentation of a grand Feſtival given at Vienna," after a picture by Alex. Lartucci, in large folio, is alſo among the fineſt and rareſt engravings of this maſter.

Adrian vander Kabel, or Cabel, was born at Ryſwick, near the Hague, A.D. 1631. He was the diſciple of John van Goyen, but appears to have formed his ſtyle partly from ſtudying the works of Salvator Roſa. He painted and etched landſcapes, which were ſometimes of paſtoral, and at others of marine character, all of which he ſtudied from nature, and imitated her with great accuracy.

The Rev. Mr. Gilpin juſtly remarks of his etchings, that, "in thoſe which he has ſtudied, and carefully executed, there is great beauty. His manner (ſtyle) is looſe and maſterly. His prints want effect, but abound in freedom. His trees are often particularly well managed: and his ſmall pieces in general are the beſt of his works."

Among theſe may be diſtinguiſhed a ſet of ſix quarto landſcapes, ornamented with figures and ruined edifices; another ſet of thirty of mountainous character, with rocks, caſtles, and cataracts; another ſet of four, alſo of romantic character, adorned with figures and ruined fabrics, in folio; a pair of landſcapes of the ſame general character, alſo in folio; and, in larger folio, another pair of "St. Jerome in the Deſart," and "St. Bruno," or, according to Strutt, "St. Anthony," alſo in a wild and ſavage landſcape. It is remarkable, that in the latter plate the figure of the ſaint is *engraved*, without any croſs-hatchings, in the ſtyle of Mellan, and if Strutt's conjecture be right, is inſerted by ſome other artiſt. The two latter prints are probably the rareſt, though not the beſt, of the prints of Vander Kabel, who died at Lyons in the year 1695.

Jeremiah Falck, or Falk, was born at Dantzic ſome time about the year 1630. In his youth he travelled to Paris, and ſtudied under Chaveau, but ſettled afterwards in Holland, where he etched and engraved ſeveral plates for the cabinet of Reynſt, in conſequence of which he is generally claſſed with the engravers of the Low Countries. He worked both with the etching-needle and the graver, and engraved hiſtory and portrait with conſiderable ſucceſs. In the courſe of his life he viſited the courts of Denmark and Sweden, but finally eſtabliſhed himſelf at his native city of Dantzic, where he died at an advanced age.

The number of his plates that are ſubſcribed with his name, with the addition of "Van Stockholmia," ſhew that he muſt have remained in Sweden for ſome years, and have given riſe to the ſuſpicion of Strutt, that he was a native of that country. His ſtyle of engraving is vigorous and free, and his drawing tolerably correct, but his chiaroſcuro is defective in harmony.

The Abbe Marolles was in poſſeſſion of ninety-three engravings from the hand of Jeremiah Falck, from which the following may be ſelected, as affording the beſt ſpecimens of his abilities; *viz.* the *Portraits* of Tycho Brahé, inſcribed "Non habere ſed eſſe;" William Blaeu, the diſciple of Tycho Brahe, a celebrated geographer, both in folio, and from drawings by himſelf; Conſtantine Ferbor, of Hamburgh, after Ad. Boy; Andrea de Leſzno Leſczynſki, biſhop of Kaminiec, inſcribed J. Falk, Polonius ſc.; queen Chriſtina of Sweden; Peter Gembici, biſhop of Cracovie, all after his own drawings; Hans Schack, a Daniſh general, after C. van Mander; Louis de Geor, after David Beck; Leonard, count of Torſtenſohn; Axel, count of Oxenſtiern; Axel Lilio, a ſenator of Sweden; Adolphus Johan, prince palatine; Charles Guſtavus, prince of Sweden, all after D. Beck, and in folio; and Adrian Spiegelius, for the folio edition of his works, which was publiſhed at Amſterdam, A.D. 1645.

Hiſtorical, &c.—A ſet of "The four Evangeliſts," half-length figures, in quarto; "A Concert of Muſic," conſiſting of four performers, after Guercino, engraved for the cabinet of Reynſt, in large folio; "The Virgin and infant Chriſt, accompanied by St. John," after J. Stella, in folio; "The Cyclops at the Forge," after Michael Angelo; "Eſau diſpoſing of his Birthright to Jacob," after Tintoretto; "A Man and Woman ſinging," from a picture attributed to John Lys, in folio; "The old Coquet at her Toilette," from the ſame painter; and "St. John preaching in the Deſart," after Bloemart, a very capital engraving, both in large folio. The laſt five engravings were for the cabinet of Reynſt.

John Hackaert, the landſcape-painter of Amſterdam, of whom we have treated in our vol. xvii. etched a few plates, about this period, with much ability, and in a ſtyle reſembling that of Waterloo.

Of theſe the chief are a ſet of ſix quarto plates of ſimple rural ſcenes, apparently views from nature. They are etched with taſte, and No. 4 is particularly beautiful.

Daniel Stoppendael of Holland was born in the year 1630 In his ſtyle of engraving he was a follower of Cornelius Viſſcher, but, like other *followers*, was always behind.

His principal engravings are, a portrait of Eraſmus reading, on a pedeſtal, in large folio; a ſet of twelve of figures and animals, in quarto, dated 1651; a collection of ſixty views, entitled "Les delices dic Diemen Meer," engraved from his own drawings, and another ſet of thirty-four views in Holland, all of quarto dimenſions.

B. Stoppendael, or Stoependaal, was the countryman and contemporary of Daniel. Whether they were related is uncertain. He migrated to England with William III. and his principal works, which are now become ſcarce, record the events of the revolution, which placed William and Mary on the throne of theſe kingdoms.

"An Attack of a Convoy of Proviſions;" the robbery of a coach, commonly known by the title of "The Piſtol Shot," and "The Lime-kiln," were engraved by Stoppendaal, after Viſſcher's prints from Bamboccio, and are at preſent more ſought after than the originals. "The Departure of William III.;" "The Arrival of that Prince in England;" "His Coronation;" and "His Opening of the Parliament," are of folio ſize, and from deſigns by the engraver himſelf.

Frederic Henry van Hohe was born at Haerlem, A.D. 1630, but migrated to England, and reſided chiefly in London, where he was employed by the bookſellers, and chiefly by John Dunton. His abilities were not conſiderable, but at a period when few engravings appeared that were ſuperior to his, it is not to be wondered at that thoſe of Van Hove ſhould have been held in ſome degree of eſtimation.

His prints are dated from 1648 to 1692, in which laſt year he executed the portrait of king William on horſeback, which was prefixed to "The Epitome of War." His beſt engraving, according to Strutt, is the portrait of Jacob Cornelis, a middling-ſized upright plate arched at the top, from C. Viſſcher, whoſe ſtyle of engraving he has imitated with ſome little ſucceſs. The productions of his graver were chiefly portraits, among which are thoſe of ſir Edmundbury Godfrey, in folio; and ſir Matthew Hale, in quarto. He engraved this laſt portrait twice, but the ſmalleſt is the moſt eſteemed. Several frontiſpieces and book ornaments, and many of the plates for Quarles's Emblems, are alſo among the prints of Van Hove.

The Bouttats were a numerous family of painters and engravers,

engravers. Frederic was born at Antwerp A.D. 1630, and had twenty-four children, of whom twelve were educated to different branches of fine art. Frederic publiſhed the works of other engravers as well as his own, and may deſerve more credit in the annals of commerce (if ſuch there be) than can be allowed him in thoſe of art. He worked with the graver only, in a neat but dry ſtyle; his works are numerous, and conſiſt chiefly of portraits, but their merits are ſmall. From among them the following may be ſelected with advantage.

The *Portraits* of J. Baptiſt van Heil, a portrait-painter of Bruſſels; Daniel van Heil, a landſcape-painter; and Leo van Heil, an architect, from pictures by J. Baptiſt van Heil; David Ryckaert, from a picture by himſelf; Charles Emanuel, duke of Savoy; Charles Gaſpar, elector of Treves; Chriſtina, queen of Sweden; Oliver Cromwell; Frederic-William, elector of Brandenburg; John George, elector of Saxony, all in quarto.

Of his *Hiſtorical* engravings—"The Holy Virgin, with St. John and the Infant Saviour;" and "A Card Party," from a deſign by himſelf, are alone worthy of notice.

Gaſper Bouttats was a younger brother of Frederic, who worked chiefly for the Dutch bookſellers. His prints conſiſt chiefly of etching, which he performed without taſte, in a tame and rapid ſtyle.

Beſide his book-plates, which we ſhall not enumerate, he engraved a few of larger dimenſions, among which are, "The Maſſacre of the Huguenots;" "The Aſſaſſination of Henry IV. of France;" and "The Decollation of the Counts Nadaſti and Cerini, and the Marquis Franciſſani," all of large folio ſize, which, as they are without painters' names, are perhaps deſigned by himſelf; and "A Proviſion Tent," after Wouvermans, alſo in folio.

Gerard Bouttats was of the ſame family, and was born A.D. 1634, at Antwerp. He travelled during his youth to Vienna, where he became engraver to the univerſity. His works riſe not above mediocrity, and conſiſt principally of portraits from his own drawings: among them are Adamus Munds; Antonio d'Aument; Charles Joſeph, archduke of Auſtria; and Don Peter, king of Portugal, all of quarto ſize.

His beſt *Hiſtorical* prints are, "The Name of Jeſus;" and "The Reſurrection of our Saviour," both in quarto.

Philibert Bouttats was likewiſe a native of Antwerp, and one of the ſons of Frederic. His engravings are moſtly portraits, but are deſtitute of merit. Among them is pope Innocent XI. in large folio; the dauphin, ſon of Louis XIV.; and its companion, Mary-Ann Victoria of Bavaria, both in folio ovals; Elizabeth Charlotte, ducheſs of Orleans; William-Henry, prince of Orange; Chriſtian V. king of Denmark; Herman Werner, biſhop of Paderborn, in a circle; Alexander Sidney, ambaſſador; John Sobieſki, king of Poland, all in folio; and a Theſis, with the portrait of the biſhop of Munſter, in large folio. We paſs over Peter Balthaſar, and the remainder of this family, as too inconſiderable to be worthy of the reader's attention.

Adrian Lomelin was born at Amiens in the year 1636. He ſtudied the art of engraving at Antwerp, and always reſided there. He worked with the graver only, and handled it very indifferently, but, unfortunately, ſeveral of the capital pictures of Rubens fell into the hands of this engraver, and his works are here ſpecified chiefly on account of the merits of the originals.

However, ſome of his portraits after Vandyke are not wholly deſtitute of merit, and from theſe the following may, with advantage, be ſelected.

Charles I. king of England; Ferdinand of Auſtria, governor of the Low Countries; Jacob le Roi, lord of Herbaix; John Charles de la Faille, a Jeſuit of Antwerp; Alexander de la Faille, an Antwerp ſenator; Zegher van Houtſum, of Antwerp; Adrian Stevens, an eccleſiaſtic; John Malderus, biſhop of Antwerp; John de Wael; and John Baptiſta de Biſthoven, an Antwerp Jeſuit. This laſt is reckoned the very beſt of the portraits of Lomelin: all are after Vandyke, and of folio dimenſions.

Hiſtorical, &c.—"Abigail appeaſing David;" "The Adoration of the Eaſtern Kings;" "The Circumciſion;" "The Baptiſm of Chriſt;" "Mary waſhing the Feet of Chriſt;" "Chriſt appearing to Mary Magdalen;" "The Trinity;" "The Triumph of Charity;" "Time unveiling Truth and conquering Hereſy;" "The Aſſumption;" "The Virgin and Infant Saviour," attended by St. Dominic, and various others, all of large folio ſize; "St. Cecilia," in folio; "The Judgment of Paris," in large folio, all after Rubens; "Chriſt taken in the Garden," from Vandyke; and "The Holy Virgin," with the youthful Saviour preſenting a crown to four fathers of the church, in folio, after Diepenbeck.

Nicholas Pitau, or Pithau, was born at Antwerp in the year 1633. He was the ſon and pupil of James Pitau. He travelled to Paris A.D. 1660. Baſſan erroneouſly informs us that he was born in 1664 at Antwerp; and Watelet ſays at Paris in 1633; Huber and Martini correct theſe miſtakes, and from other authorities it appears certain that he was at Paris the time we have mentioned above, and died there ſome time about the year 1676. His ſtyle of engraving nearly reſembles that of Francis de Poilly, though his ſtrokes are more vigorous. His drawing is in general tolerably correct, but, at times, is rather heavy, eſpecially in the extremities of his figures. He worked with the graver only, and appears to have handled that inſtrument with much facility; but from the ſameneſs of manner with which he has treated his figures, draperies, and back-grounds, the effect of his prints is cold and ſilvery. Watelet, who generally writes with more taſte and feeling than almoſt any other of the foreign critics on engraving, praiſes him ſomewhat too highly, when he aſſerts that "Pitau's engraving of the Holy Family, after Raphael, is a chef-d'œuvre, both for the beauty of the execution, the purity of the drawing, and the ſtrength and juſtneſs of the effect. The character of Raphael has, perhaps, never been ſo faithfully tranſlated as in this print, which, by amateurs, has been preferred to the famous engraving of the Saint, by Edelinck," which is after the ſame celebrated maſter.

This artiſt engraved both portraits and hiſtorical ſubjects, and the following are ſelected from his beſt.

Portraits.—St. Francis of Sales, biſhop and prince of Geneva; Louis Henry, duke of Bourbon; Oliver Cromwell, after Vander Werf, all in folio; Alexander VII., after P. Mignard, in large folio; Vincent de Paule, founder of the congregation of the Miſſion of St. Lazarus, after Sim. François, in folio; James Fabier du Bulay, maſter of the court of Requeſts; and Henry Louis Hubert de Montmort, of the French Academy, both in ovals of folio ſize; Theodore Bignou, maſter of the court of Requeſts, all after Ph. de Champagne; Peter Seguier, chancellor of France, from N. de Platte Montagne, in large folio; Prioli, author of the French Hiſtory; Alexander Paul Pitau, counſellor, both in folio; Gaſper de Fieubet, chancellor; Nicholas Colbert, in large folio, all after C. le Febure; Louis XIV. of France and Navarre; the dauphin, ſon of Louis XIV. both from le Febure; and an anonymous portrait of a man, half-length, after John Daret, all of large folio ſize.

Hiſtorical, &c.—"The Holy Family," after Raphael, in folio; "The Entombing of Chriſt," after L. Caracci, in large folio; "The Virgin with the Infant Saviour reading," in an oval, after Guerchino; "A dead Chriſt, with Angels weeping over him," from the ſame painter; a half-figure of "The Virgin with the Infant Chriſt," in folio; "Jeſus Chriſt in the Clouds, with St. John and the Virgin interceding for St. Bruno," in large folio; "Chriſt and the Woman of Samaria;" "The penitent Magdalen;" "The Council of St. Sulpitius;" and "The Holy Family," all after Ph. de Champagne, and of folio ſize. Another "Holy Family," wherein an angel is preſenting the infant Saviour with a baſket of flowers, after Villequin; and a large Theſis, after Seb. Bourdon.

Charles or Karel du Jardin was born at Amſterdam in the year 1635, and died at Venice in 1678. He was the diſciple of Paul Potter, or, as ſome authors affirm, of Berghem; and after ſtudying for ſome years in his native country, made a voyage to Italy, under the pretext of accompanying a friend to Livourna.

Here he was ſo well pleaſed, either with the climate and landſcape ſcenery, or the patronage which Italy afforded him, that he continued there for the remainder of his life. As a painter, we have already treated of the merits of Du Jardin. Both as painter and engraver, he added ſparkling force to the taſte and touch of Berghem. He underſtood the anatomy of domeſtic animals, perhaps better than Potter or Berghem. He drew with the utmoſt freedom, though his drawing is ſtrictly correct. He copied nature ſimply and exactly, though not ſervilely; and has given us not only the form, but the characteriſtic peculiarities alſo, of each animal. He never indeed, like Hondius, animates his creation with the violence of ſavage fury: his genius takes a milder turn. In his prints, all is quietneſs and repoſe. His dogs, after their exerciſe, lie ſtretched at their eaſe; and the languor of a meridian ſun commonly prevails through the piece. His compoſition is beautiful; and his execution, though neat, is ſpirited.

Some of his prints are of quarto, and others of folio, dimenſions; but they are generally met with, bound together in a folio volume, which is highly and juſtly valued by all perſons of taſte, and conſiſts of fifty leaves. His ſubjects are generally landſcapes, or paſtoral converſations, in which cattle are often the principal objects. Of that which is placed the fifth in the volume, the Rev. Mr. Gilpin has written: "The deſign, though humble, is beautiful. The two dogs repoſing at noon, after the labour of the morning, the implements of fowling, the fictitious hedge, and the loop-holes through it, all correſpond, and agreeably tell the little hiſtory of the day. The compoſition alſo is good. The nets and fowling-pieces are judiciouſly added, and make an agreeable ſhape with the dogs. The hedge adds another pyramidal form. The light is well diſtributed. The drawing and expreſſion are pure nature, and the execution elegant and maſterly."

RUYSDAEL, (for an account of the character of whoſe merits as a painter, ſee that article,) executed, about this period, ſome very maſterly etchings: they are ſlight, but very pictureſque, and may be conſidered as beautiful ſketches from nature. The following are a ſelection of the beſt: a very ſcarce, woody landſcape, of very delicate execution, in ſmall 4to.; a ſea-view, with veſſels, and a mountain towards the left, crowned with trees and buildings, in 4to.; a cottage emboſomed in trees, with a wooden bridge, and a peaſant and dog, in folio, executed in a broader ſtyle; a foreſt ſcene, in folio; and a landſcape of wild character, with a hovel on the deſcent of a hill, in folio.

John le Ducq was a native of the Hague, and born in the year 1636. He learned the rudiments of painting of Paul Potter, whoſe ſtyle he imitated with much ſucceſs. In 1671 Le Ducq was made director of the academy of painting at the Hague, and enjoyed the reputation of a good artiſt; but after ſome years he quitted the arts, and entered the military ſervice. Le Ducq executed ſeveral etchings from his own deſigns, with much intelligence and preciſion; among which is a ſet of eight quarto plates, of dogs, dated 1654.

Romyn or Romain de Hooghe was born at the Hague in the year 1638; and being a man of genius, and of great fertility of invention, ſoon diſtinguiſhed himſelf both as a deſigner and engraver. His ſtyle of art was ſingular and extravagant; but the ſurpriſe which his deſigns excited, and the impreſſion which their novelty made on the public mind, occaſioned his compoſitions to be much ſought after; and he compoſed and engraved many of the frontiſpieces to the books which were at that time printed in Holland.

The Rev. Mr. Gilpin ſays of him: "Romain de Hooghe is inimitable in execution. Perhaps no maſter etches in a freer and more ſpirited manner: there is a richneſs in it, likewiſe, which we ſeldom meet with. His figures, too, are often good; but his compoſition is generally faulty: it is crowded and confuſed. He knows little of the effect of light. There is a flutter in him, too, which hurts an eye accuſtomed to, and pleaſed with, ſimplicity."

His prints are generally either hiſtorical or allegoric; and among them, "The Deluge at Coeverden" (which, as Mr. Gilpin ſays, is finely deſcribed) has excited much notice.

This Deluge at Coeverden is a ſmall folio print, and is properly an *hiſtorical landſcape.* De Hooghe had here a *country* to deſcribe, and a *ſtory* to tell. The country is the environs of Coeverden, a Dutch town, with an immenſe bank thrown up againſt the ſea; the ſtory is the ruin of that bank, which was broken through in three places by the violence of a ſtorm. The ſubject was great and difficult, and the artiſt has acquitted himſelf in a maſterly manner. The town of Coeverden fills the diſtant view: the country is overſpread with a deluge, the ſky with a tempeſt, and the breaches in the bank appear in all their horror. The compoſition, in the diſtant and middle parts, is as pleaſing as ſuch an extenſive ſubject can well be. An elevated horizon was neceſſary to give a diſtinct view of the whole. The light is thrown over the landſcape in good maſſes; and the degree of flutter, which Mr. Gilpin ſeems to cenſure above, was here congenial to the ſubject. The expreſſion of the figures, of the horſes eſpecially, is very ſtrong: thoſe which the driver is turning, to avoid the horrid chaſm before him, are impreſſed with the wildeſt character of terror; and indeed the whole ſcene of diſtreſs, and the horrible confuſion in every part of it, are admirably deſcribed.

The execution, though good, is inferior to that of ſome others of the works of De Hooghe; and, with the foreground, a popular critic finds the following fault: The ſpirit, he ſays, which the artiſt has maintained through the reſt of the piece, ſeems here to flag: whereas here he ſhould have cloſed the whole with ſome noble confuſion, which would have ſet off the diſtant parts, and ſtruck the ſpectator with the ſtrongeſt images of horror. Inſtead of this, we are preſented with a few pigs and calves floundering in the water. The thought ſeems borrowed from Ovid. In the midſt of a world in ruins,

——"Nat lupus inter oves."

Among the numerous productions of this artiſt, the following are the moſt diſtinguiſhed: Servatus Gallæus, Roterodamenſis Batavus, in folio; admiral Michael Adriaenſz de Ruyter, a very fine portrait, in large folio; “The Army of William III. at the Battle of the Boyne,” and a medallion of himſelf and queen Mary, in large folio; “William Henry, prince of Orange, on Horſeback, accompanied by the young Princes, entering the City of Amſterdam;” an allegorical ſubject, relating to prince William Henry; another allegory, in compliment to Leopold II.; “The Marriage of William, Prince of Orange, with the Princeſs Mary;” “The Entry of the Prince of Orange into London;” “The Coronation of William III. in Weſtminſter Abbey;” “The Flight of James II. into France;” “Louis XIV. receiving James at St. Germains;” “The Siege of Vienna by the Turks;” “The Return of John III. king of Poland, after defeating the Turks;”; “The Siege of Rocheſter,” and “Taking of the Fort of Sheerneſs,” both ſubjects on one plate; “The Exceſſes committed by the French Soldiers at Bodegrave, and other Places in Holland;” “The Defeat of the French at Hochſtädt in 1704,” with the medallions of prince Eugene and the duke of Marlborough, all of large folio ſize; “The taking of Conſtantinople by the Turks,” in folio; “The Jews' Synagogue at Amſterdam;” “The taking of Nerva by Charles XII. in the Year 1700;” “The City of Gran, aſſaulted by the Imperialiſts,” both in large folio; “The Battle of St. Denis,” on two large plates; “The Prince of Orange declared Stadtholder of Holland;” “The Arrival of the Prince of Orange at London in 1688,” in large folio; twelve plates, illuſtrative of the faſhions of the ſeventeenth century, invented by De Hooghe, in 4to.; “The Deluge at Coeverden,” in folio, (the plate on which we have commented at ſome length); “The Entry of Louis XIV. into Dunkirk,” a large print, lengthways, on two plates, from Vander Meulen; “Charles II. king of Spain, deſcending from his Carriage to pay Homage to the Hoſt,” in folio, from De Hooghe's own compoſition; “The Maſſacre of the two De Witts,” in folio; an emblematical print, expoſing the vices of the monks and other eccleſiaſtics of the Romiſh church, a middling-ſized plate, lengthways, with the name of Loggan affixed to it, though it is evidently the work of De Hooghe, who, fearful perhaps of affixing his own name, fathered this engraving upon a foreign artiſt; and “The Fair at Arnheim,” in large folio.

Abraham Genoels, ſurnamed *Archimedes*, was born at Antwerp in the year 1638. He learned the rudiments of art of Jacques Backreel, and afterwards travelled to Paris for improvement, where he was employed by Le Brun and De Seve, and where a royal penſion and apartments in the Gobelins were aſſigned him. From the French metropolis, Genoels travelled to Italy, the common theatre of improvement, and after ſtudying there awhile returned to Paris, with the reputation of an excellent artiſt. In 1682 he viſited his native city, where he died at an advanced age. Genoels executed a conſiderable number of etchings of landſcapes in a free maſterly ſtyle, ornamented with very good figures and animals; a conſiderable number of them are from his own deſigns, and the large ones are particularly excellent. His compoſition is in general good, though perhaps, in ſome inſtances, a little too much crowded with objects. His prints ſhould be viewed as engraved *ſketches*, not as tranſlations of finiſhed pictures. This is the limit of their pretenſion, and thus regarded they are beautiful productions. The monogram of this artiſt will be found in *Plate* IV. of thoſe uſed by the artiſts of the Netherlands.

The following are a ſelection of the works of Genoels. A pair of mountainous landſcapes, with figures and monuments in the antique taſte, in 4to; three pair of landſcapes of the ſame character, and alſo in 4to; a ſet of four mountainous landſcapes, with water and buildings; four garden views with figures and ſtatues, in 4to; a pair of very fine Italian views, ornamented with figures and ſtatues; an Italian garden, with fountains and figures; a large landſcape with a waterfall; and a rocky ſcene with water, all of large folio dimenſions, are generally reckoned to be his very beſt productions.

James Neefs was born at Antwerp, A. D. 1630, and was probably related to Peter Neefs, the celebrated painter of architecture. He worked principally with the graver, and handled it with great facility. He drew the human figure with ſome degree of correctneſs, but in a mannered ſtyle. The characters which he has given to the heads of his figures, eſpecially when they required alſo an animated expreſſion, is often exaggerated.

He engraved both portrait and hiſtory, and his beſt works, though faulty in the above reſpects, have much merit on the whole. The following are ſelected as being moſt worthy the attention of the collector.

Portraits.—Joſeph Bergaigne, a Roman prelate, from Th. van Thulden; Gaſpar Nemius, biſhop of Antwerp, from G. Seghers; John Tollenario, a Flemiſh Jeſuit, from P. Fruytiers; Francis Snyders, the painter, the plate of which was etched by Vandyke, and finiſhed with the graver by Neefs; Anthony de Taſſis, from Vandyke; the marchioneſs of Barlemont, and counteſs of Egmont; Joſhua de Hertoghe, a miniſter of his Catholic majeſty at Ratiſbon; Martin Ryckaert, landſcape painter at Antwerp, all from Vandyke; Jaan Dolenaris, Jeſuit and author of the Speculum Vanitatis, after Ph. Fruytiers, all of folio ſize.

Hiſtorical, &c.—“The Fall of the Damned;” “Melchizedeck preſenting Bread and Wine to Abraham;” “Chriſt on the Croſs,” all in large folio; “St. Auguſtin,” in folio; “The Martyrdom of St. Thomas;” “The Judgment of Paris;” “The Triumph of Galatea,” very rare, all in large folio; “Philippus Prudens, Antwerpia,” repreſenting the king of Spain crowned by two genii, in folio; “The Cardinal Infanta of Spain,” in folio, all after Rubens; a woman with milk pails, and another with a baſket on her head; “Jeſus Chriſt and the ſix Penitents,” after Seghers, in large folio; “Job mal-treated by his Wife,” in folio; “The Martyrdom of St. Lievens;” “Jeſus Chriſt appearing to Mary Magdalen,” in large folio, after Seghers; “Chriſt before Pilate,” after Jordaens; “The Satyr, or the Gueſt who blew Hot and Cold,” in large folio; “A Shepherd and Shepherdeſs at rural Diverſion,” both after the ſame painter, in folio; and “St. Roch interceding for thoſe afflicted with the Plague,” after Eraſmus Quellinus, in folio.

Anthony Francis Baudins, or Baudouins, was born at Dixmude in the year 1640, and died at Paris in 1700. He was the diſciple of Vander Meulen, and con-diſciple of Van Hugtenbourg. He etched in a bold, free ſtyle, not unlike that afterwards adopted by Chatelain. Baudins executed a great number of plates, moſt of them from Vander Meulen; the beſt of which are as follows: a ſet of ſix landſcapes, in ſmall folio; a ſet of ſix, with buildings and figures, dedicated to Ph. de Champagne, in large folio; a ſet of eight, of buildings and figures; a hunt of hinds, dedicated to the marquis of Louvois; a ſtag hunt, a very rich compoſition; a large landſcape, into which is introduced the march of the king to Vincennes, dedicated to Le Brun; a landſcape, with the march of the queen to Verſailles, dedicated to the duke de Noailles; a view of Beſançon, on two plates; view of the city of Ardres, in Picardy; view of the city of Gray in Franche Compte; the city of Bethune in Artois, on two plates; a view of St. Lawrence de la

Roche, in Franche Compte; the caſtle of Jeux, on the frontiers of Franche Compte; the caſtle of Verſailles, as it was formerly; another view of the ſame caſtle as it is at preſent; the caſtle of Vincennes on the park ſide; the caſtle of Fontainbleau, on two plates; and two fine Italian garden views, after Genoels, all of them of very large folio dimenſions.

Michael Mouzin, or Moſyn, was born at Amſterdam in the year 1636. In the execution of his plates he united the point and the graver, but not ſucceſsfully, for his ſtyle is heavy and laboured, and his drawing incorrect. The following are extracted from his works as being moſt worthy of notice. Admiral van Waſſenaer, of Holland, in 4to. oval; admiral Ruyter, after H. van Alde, in folio; Cornelius de Witt, after the ſame painter, in large folio; John van Galen; a Dutch admiral, from Livens, in large folio; a couchant Venus, after Jac. Ad. Backer; the four elements under the empire of Venus, from Holſtein, in large folio; a group of children dancing to the muſic of a tambourin and triangle, played by a woman and ſatyr; another group of three children dancing; and a ſatyr preſenting a bunch of grapes to a female and child, all after Holſtein, in folio.

Jacob van Meurs was born at Amſterdam, A. D. 1640, but is rather an obſcure artiſt. He chiefly engraved book plates and ornaments, and ſome few portraits in a neat ſtiff ſtyle, among which are portraits of Nicholas Copernicus, the aſtronomer; Sibrandus Franciſcus Eydelſchemicus, from T. Faber, both in 4to.; profeſſor George Calixtus, in folio; Henry van Dieſt, doctor of theology, from Glauwe, in a quarto oval, and Charles II. of England, in folio, from Ant. Vandyke.

Levinus Cruylius, or Lewin Cruyl, was born at Ghent in the year 1640, but embraced the eccleſiaſtical life, and reſided at Rome. He drew and etched a conſiderable number of views in Rome, enriched with figures and buildings in a very intelligent pleaſing ſtyle. Many of his drawings were engraved by Julius Teſta, and we have alſo ſome very fine etchings by himſelf, that are marked with a monogram which will be found in *Plate* IV. of thoſe uſed by the engravers of the Low Countries. Of thoſe the chief are a ſet of twenty-three views of Rome, ancient and modern, in large folio; and another very large ſet of Roman views, with buildings and figures.

Peter Philippe, an artiſt of ſmall account, was a native of Holland, born ſome time about the year 1640. He engraved portraits, among which the following, though without poſſeſſing much merit, are probably the beſt.

A half-length of Louis Henry, prince of Naſſau, in folio; prince Henry Charles de la Tremouille, after Vander Bane; the aſſembly of the States General of Holland, after J. Toornfleet; and a Dutch banquet, after the ſame painter, all of large folio ſize.

Peter van Schuppen was born at Antwerp in the year 1623. Of whom he learned the earlier rudiments of art is not known, but he completed his ſtudies at Paris, whither he was invited at the ſame time with Edelinck, by the miniſter Colbert. His juvenile talents muſt therefore have been of high promiſe.

At Paris, he very judiciouſly placed himſelf under the inſtruction of Nanteuil; here he became juſtly celebrated both for the number and merit of his engravings, and here he died at an advanced age, A. D. 1702.

He engraved a conſiderable number of portraits, chiefly from his own drawings, and in a ſtyle which proves him to have been a man of conſiderable talent. The following are a ſelection of his beſt portraits, ſome of which are very fine. Claudius de Lingendes, in 4to.; Joannes Veriuſius, doctor of theology, after Loir; Samuel Bochart; Gilles Ménage, from de Pilles; and Nicholas le Camus, all in folio; Renaud, cardinal of Eſte, and biſhop of Reggio, in large folio; Anne de Courtenay, conſort of Maximilian, duke of Sully; Francis Pithou, juris conſulte, and Peter Pithou, his brother, all in folio; Anthony Chaſſe, prior of the monaſtery of St. Vedaſt; Peter Mercier, a general, all in folio; Francis Villani, biſhop of Tournay, from L. François; Anne Adolphine, baroneſs of Pauterſen, from the ſame painter, both in large folio; Claude Bazin of Beſon, from le Febure, in folio; Louiſa Mary Armand de Simianes, counteſs of Lyons; Louis le Pelletier, a parliamentary miniſter, from Nicholas de Largilliere; Francis van Meulen, the painter; and the prince of Wales, both from the ſame painter; Julius, cardinal Mazarine, from Nic. Mignard; Louis XIV. in a laurel border of oval form, from le Brun; the chancellor Seguier, from le Brun; Maximilian Henry, elector of Cologne, from Bartholet Flamael; Bernard de Foix, duke of Valette, from P. Mignard; Philip Deſpont, doctor of theology, from his own painting, all of large folio dimenſions.

Hiſtorical, &c.—"The Holy Virgin ſeated, with the Infant Chriſt," in an oval border of olive leaves, after Raphael, dated 1661, in folio; "The Holy Family, with St. John, who holds a Dove," from Seb. Bourdon. The earlieſt impreſſions are before the nudity of the infant was covered with drapery. "The Holy Family," after Gaſpar de Crayer; another "Holy Family," the ſame, except that the figure of St. Joſeph is eraſed; "St. Sebaſtian, with an Angel drawing an Arrow from his Body;" after Vandyke, all in large folio: and "King David," after Ph. Champagne, in folio.

The reader has probably already perceived that we are now arrived at a period, when the natural operation of commerce had tamed down engraving to the trading level, and an engraver rarely appeared in the Low Countries worthy of particular notice, though *workmen* of that profeſſion ſwarmed both in Holland and in Flanders.

The principle of the rapid acquiſition of pecuniary profit, which is the main ſpring of trade, ſeems to be eſſentially at variance with all the nobler purſuits of art and ſcience. An extraordinary artiſt—a phenomenon—may indeed now and then appear under ſuch circumſtances; as Mr. Bird, in our own times, has ſtepped majeſtically forth—the painter of pathetic ſentiment—from the tea-board manufactories of Birmingham; but the general principles of trade are not to be the leſs regarded as deſtructive, or at leaſt deeply injurious in their tendency, to all lofty intellectual effort, and all philoſophical enquiry into thoſe principles, on which improvement in art and ſcience may be perpetuated. To be exerciſed with honour and advantage to a nation, fine art has ever required a nobler impulſe and more foſtering care, than the ſhort-ſightedneſs of commerce has been inclined or prompted to beſtow. The golden eggs of art are never laid faſt enough for the cupidity of dealers. And the Cyclopædia might bluſh to detail the records of ſome engravers, who found a degree of favour and protection with the printſellers, which the word patronage was ſometimes proſtituted to expreſs, merely becauſe they *worked cheap*, and worked *ſubmiſſively*.

Among theſe obſequious tools, the engraver who would be content to afford the merchant the largeſt ſhare of profit, it became his intereſt to hold forth to the public, or to that part of the ſenſeleſs herd on whom Fortune ſhowers her favours in her moments of caprice, as the beſt artiſt. Diſheartened by preferences ſo unprincipled, the engraver of modeſt merit would retire in ſilence, and either change his profeſſion, or, if he were unable to do this, would look round for refuge where he might.

Several of thoſe of the Low Countries, who lived at this period, ſought an aſylum in England. Bouyed up by hope, perhaps attracted by falſe repreſentations of our national taſte or proſperity, they ſailed hither over a ſea of Diſappointment. They imagined an Heſperian garden, and found a ſterile waſte. They eſcaped from the rapacity of one ſet of dealers, to drudge under taſk-maſters that were more taſteleſs, and probably not leſs inexorable; and that fine ethereal mental eſſence, which is the ſpirit of art, was evaporated, partly by the ardours of trade, and partly by the agitations of political revolution.

We, therefore, ſhall paſs ſlightly over the dregs of Dutch engraving, with ſome regret on account of the nature of chronologic annals, and reſerve the remains of our particular attention for Houbraken, Audenaerd, Punt, and a few other artiſts of deſerved celebrity, with which muſt be cloſed our account of the ſchool of the Low Countries.

Conrad Waumans was born at Antwerp in the year 1630, and became the diſciple of Peter Bailliu. He unfortunately imitated his maſter, when much better models might have been found, and his drawing is not leſs incorrect, and his ſtyle of handling his graver ſcarcely a whit more principled. Yet he is the engraver of a conſiderable number of plates, which collectors have thought worthy of ſome attention. The chief of theſe are the

Portraits of John Both, (the landſcape painter and engraver,) after Willars; Herman Saftleeven; David Baille of Leyden, and Cornelius Janſen, both from pictures by that diſtinguiſhed artiſt, and all of 4to. dimenſions. In folio he engraved the marquis of Mirabelle; Emily, princeſs of Orange; Frederic Henry, prince of Orange, clad in armour; and Maria Clara, princeſs de Croye; all after Vandyke.

Hiſtorical, &c.—"The Deſcent from the Croſs," in large folio; "The Aſſumption of the Virgin," in 4to.; "The Holy Virgin and Infant Saviour," in folio; "The Holy Family with the abbé Alexander Scaglia receiving the Benediction of St. John;" and "Venus and Mars," in large folio; all after Rubens.

The family of Danckert, or Dankerts of Antwerp, though they maintained their ſtation as dealers in that commercial city for upwards of a century, were as artiſts, and ſpeaking of them in the aggregate, ſcarcely of ſuperior pretenſions to thoſe of Waumans.

Cornelius was born at Amſterdam in the year 1561, and eſtabliſhed himſelf as a printſeller at Antwerp ſome time about the middle period of his life. In his youth he produced a few meritorious prints, but (either by choice or neceſſity) his talents as an artiſt were gradually abſorbed by the craft and ſolicitudes of trade.

The *Portraits* of Guſtavus Adolphus, king of Sweden; Jacob Waſſenaer, earl of Obſdam; Cornelius de Wit; John Caſimir, count of Naſſau; John Calvin; and Peter Molinæus, all of folio dimenſions, are among the beſt of his engravings; to which the collector may add the following few *Hiſtorical* plates.

Equeſtrian figures of "Ninus," "Cyrus," "Alexander," and "Cæſar," with emblematical accompaniments, in large folio. A ſet of "The Seven Planets;" another of "The Seven Wonders of the World;" another of "The Twelve Sybils," in large quarto, all from his own deſigns; and "Meleager preſenting the Boar's Head to Atalanta," from Picou.

Danckert Dankerts was the ſon of Cornelius, and was born at Antwerp ſome time about the commencement of the ſeventeenth century. He was educated to engraving, but he was educated alſo to commerce, and ſucceeded his father as a printſeller.

He engraved portrait and landſcape, mingling in his technical practice the work of the etching needle with that of the graver. In his ſtyle of treating landſcapes, paſtorals, and cattle, he imitated Berghem and Viſſcher, but preſented us with little more than the *caput mortuum* of their abilities. He gradually fell into a dry and heavy habit of croſſing his firſt courſes of lines with ſquare ſecond courſes, and the taſte and intimate knowledge of forms by which thoſe great maſters are diſtinguiſhed, were in Dankerts utterly extinct.

He engraved chiefly after Berghem, and his beſt productions are "The Hartengaſt," or Stag-hunt; "Het Vinkebaantze," or, the Bird Catcher, both in large folio. A ſet of four large landſcapes of paſtoral ſubjects, of which one has the effect of moon light. Another ſet of four, with cattle and figures, of ſomewhat ſmall dimenſions. Another ſet of ſix, of ſimilar ſubjects, and a ſet of four, in folio, of which the title-page bears the inſcription "Danckert Danckerts fec. et exc." cut on a ſtone, all from the pictures of Berghem.

Of his *Hiſtorical* prints we need only mention "The Departure of Charles II. for England;" "Venus, Cupid, and Satyr," and a fountain with fiſhermen. There is alſo a print, which bears his name, of a curious cryſtal vaſe, which was found in the treaſury at Vienna; and his moſt eſteemed portraits are thoſe of Charles II. of England, and Bernard, earl of Martenitz.

John Danckerts was of Amſterdam, and of the ſame family with the preceding artiſt; the year of his birth has not been recorded, but ſoon after the middle of the ſeventeenth century he emigrated to England, where he engraved ſeveral plates after Titian and other maſters, and where he is ſaid to have produced the deſigns for the Engliſh tranſlation of Juvenal, which were engraven by Hollar.

Juſtin Danckerts was of the ſame family, and was alſo a printſeller of Amſterdam. He engraved the portraits of William, prince of Orange, and Caſimir, king of Poland; a Venus and ſleeping Cupid, and a ſet of the ſeven gates of Antwerp; more than which it would be needleſs to ſpecify of works ſo utterly worthleſs as productions of art.

Henry Danckerts was brother to John, and was likewiſe educated an engraver, but quitted that profeſſion to take up the pallet and pencils. He excelled in painting landſcape, and travelled to Italy for improvement, where he reſided during ſome time; from thence he came into England, and was patronized by Charles II. who employed him to paint views of the royal palaces, and the ſea-ports of England and Wales. Theſe works are dated 1678 and 1679. At the diſcovery of the Popiſh plot, being a Roman Catholic, and probably a ſuſpected character, he returned to Amſterdam, where he ſoon afterwards died.

The following are the moſt important of his engravings: *Portraits* of king Charles II.; Ewald Screvelius; and Chriſtian Rompf, (both phyſicians to the prince of Orange,) in large folio; a ſet of the ſea-ports and palaces of England, and a large view, engraved on three plates, of the Y at Amſterdam.

Simon Vlieger was born at Amſterdam in the year 1612. He ſtudied painting under Vander Velde the younger, and excelled in repreſenting landſcapes and ſea-views. This artiſt likewiſe etched ſeveral paſtoral ſubjects, ornamented with figures and animals, in a ſtyle which combined that of

Rembrandt with the ſpirit of Van Uden. The mark which he frequently affixed to his engravings will be found in our *Plate* IV. of thoſe uſed by the artiſts of the Netherlands: and the following is a ſelection of his beſt works.

A landſcape, with a barge unlading on the banks of a river; a pair of landſcapes, with trees, water, and figures, in quarto, executed in a very delicate ſtyle; a fiſh-market, with figures; a Dutch inn; a landſcape, with water and ruins; and another landſcape, with a number of turkies on the foreground, all of folio ſize.

Valentine le Febre, or Le Febure, was born at Bruſſels in the year 1642. In his youth he went to Venice to ſtudy the works of Titian and Veroneſe, and acquired ſome reputation as a painter. But his engravings, in general, are feeble, and want harmony; and the naked parts of his figures are heavy and mannered. He, however, handled the point with great facility, and produced good effects of chiaroſcuro.

In the year 1680, a ſet of fifty engravings, by this artiſt, appeared at Vienna, entitled "Opera ſelectiora, quæ Titianus Vecellius Cadabrienſis, et Paulus Calliari Veronenſis invenerunt et pinxerunt; quæque Valentinus le Febre Bruxellenſis delineavit et ſculpſit." In 1682, another edition was publiſhed, and in 1749 a third, with the plates retouched by John Adam Schweighart, of Nuremberg.

John Francis Milet, ſurnamed *Franciſco*, was born at Antwerp in the year 1644. He was of French extraction, and becoming the diſciple of Lorenzo Frank, was inſtructed to imitate the learned and admirable ſtyle of Pouſſin.

He became a painter and engraver of epic and heroic landſcape; travelled to Paris, and from thence to England, where he left ſome teſtimonials of his merit as an artiſt. On his return to Paris he was elected a profeſſor in the French academy, and ended his days in that metropolis, in the year 1680, leaving behind him ſeveral children, of whom two became painters.

The engravings of Franciſco are juſtly regarded with ſome intereſt by connoiſſeurs. D'Argenville mentions the ſubjects of only three, but the following are all after his compoſitions, and have every appearance of being the productions of the ſame hand.

An heroic landſcape, with Egyptian edifices, "The Nile, and Moſes floating in the Ark of Bulruſhes." Another, with the ſtory of Cephalus and Procris; a mountainous ſcene, with buildings and figures in the taſte of Pouſſin; another with paſtoral figures; another with figures bathing; another, in which is introduced the ſtory of the woman of Canaan; an Italian garden ſcene with a bridge and figures, and a pair of upright landſcapes, with ruined buildings and figures in the coſtume of antiquity, all of large folio dimenſions.

Cornelius Vermeulen was born at Antwerp in the year 1644. He travelled to Paris for profeſſional improvement, and reſided there for ſome years, but at length returned to his native country, and died there in 1702.

He handled the graver with judgment, his chiaroſcuro is tolerably good, and his ſtyle of manual execution poſſeſſes conſiderable neatneſs and clearneſs; but he did not underſtand the human figure correctly enough to excel in hiſtorical ſubjects, and his *portraits* are therefore his beſt works.

From theſe the collector may with advantage ſelect thoſe of queen Elizabeth; Anne Boleyn; Catherine Howard; and Oliver Cromwell, all after Vander Werf; John Baptiſta Boyer d'Aquilles; Louis de Clermont, biſhop of Leon; Henry Meyercron, envoy to the court of Denmark from France, all in folio; Maria Louiſa d'Orleans, ducheſs of Montpenſier, in an oval; Louis de Luxembourg, marſhal of France; Peter Vincent Bertim; Bardo Bardi Magalotti, a Florentine gentleman; Joſeph Roettiers, a medal engraver, all from H. Rigaud; Philip V. of France; Maximilian Emanuel, elector of Bavaria; Nicholas de Latinat, marſhal of France; Agnes Frances Lelouchier, counteſs of Arco, all after J. Vivier, in large folio; Louis Urban le Fevre de Caumartin, maſter of the Requeſts, from F. de Troy, in folio; Francis Brunet, preſident of the grand council, and Mezetin Angelo Conſtantine, both after the ſame painter; Maria Louiſa de Taſſis and Nicholas vander Borcht, both after Vandyke.

Theſe are his principal portraits, which are all of folio dimenſions. His few *hiſtorical* engravings that are worthy of notice, are "Erigone, with Bacchus under the Form of a Bunch of Grapes," in folio, after Guido. One of Rubens's Luxembourg gallery, from the Life of Queen Mary de Medicis, and a courtly allegory of "Louis XIV. conquering Hereſy," from a marble group, by Le Conte, both of folio ſize.

Adam van Zylvelt was born at Amſterdam, A.D. 1645; under what maſter he ſtudied is not known, but he evidently imitated the ſtyle of John Viſſcher. His principal works conſiſt of portraits, in the execution of which he rarely went beyond mediocrity, and of theſe the chief are Coornhaert the engraver, in 4to.; Stephen le Moine, a theologian of Leyden; Chriſtopher Wittichus, profeſſor of the Leyden academy, and Herman Witſius, a theologian; all from J. Heyman, and all of folio ſize.

Albert Meyeringh was a painter and engraver of landſcape and ornament. He was born at Amſterdam in the year 1635, and died in that city in 1714.

Albert learned the rudiments of art of his father Frederic Meyeringh, but owed the degree of excellence to which he attained rather to his own genius, and his friendſhip with Polydore, who was his fellow ſtudent. In his youth he travelled through France, and from thence to Italy for improvement. Here he firſt became acquainted with Polydore, and here for ten years the two friends purſued their ſtudies together.

Meyeringh now returned to Holland, and was much employed in painting the ceilings and other decorative parts of various public edifices. He alſo painted landſcape, and etched ſeveral folio plates, all from his own compoſitions, in a free and painter-like ſtyle. Their ſubjects conſiſt chiefly, like thoſe of the etchings of his friend Polydore, of rocky mountains, cataracts, and other romantic landſcape ſcenery, adorned with cattle, figures, and ruined edifices.

Of the ſuperior merits and general biography of John Glauber, the reader will find an account under the article Polydore. The etchings of this maſter are performed in a ſlight ſtyle, and their chiaroſcuro is but feeble. Yet are they valuable, on account of the claſſic or paſtoral beauties of his compoſition.

He in general etched after his own pictures, but he produced one claſſic landſcape with rocks and waterfalls after Pouſſin, and his allegorical ſet of the revolutions of the four great nations of antiquity, which is intitled "Statum Aſſyriorum, Perſarum, Græcorum, et Romanorum," is after Gerard Lairesse, as is alſo "Abiſhag before David." All the prints of Polydore are of folio dimenſions.

John Biſſchop, or Epiſcopius, was born at the Hague in the year 1646, and died at Amſterdam in 1686. He owed his excellence as an artiſt entirely to his own genius, having never ſtudied under any maſter. He made deſigns in diſtemper with great taſte, and which are beautifully finiſhed; and his etchings are very much eſteemed by connoiſſeurs, they are harmoniſed with the graver, and though ſlight, are free, intelligent, and pleaſing. He imparts richneſs to his tones, and roundneſs to his figures, far beyond what is uſually done with the point, ſo little aſſiſted as it is in the prints of Biſſchop by the graver. His figures in general are drawn with ability, yet in a mannered rather than a correct ſtyle. The extremities, indeed, are not always well marked, nor his heads equally expreſſive or beautiful.

His moſt conſiderable work is intitled "Paradigmata graphices variorum artiphicum tabulis Æneis," Hague 1672, in folio. Two editions of this work were publiſhed in the ſame year, one by the artiſt, conſiſting of one hundred and two plates; the other contains one hundred and thirteen, and was publiſhed by Nic. Viſſcher. As they differ eſſentially, the curious are generally deſirous of poſſeſſing both.

The mark uſed by this artiſt was a J and E, becauſe he latiniſed his name, ſubſtituting Epiſcopius for Biſſchop: this monogram will be found in *Plate* IV. of thoſe uſed by the artiſts of the Netherlands.

The remainder of the engravings by Biſſchop, are "Chriſt and the Woman of Samaria," in large folio, after Annibale Caracci; "Joſeph diſtributing Corn to the Egyptians," in large folio, from Bartholomew Brunberge; "The Martyrdom of St. Lawrence," its companion, from the ſame painter. A large book from the drawings of the great maſters; and a book of ſtatues.

John van Hugtenburg, or Huchtenbourg, was born at Haerlem, A.D. 1646, and died at Amſterdam in 1733. He ſtudied painting under John Wyck, and afterwards went to Italy for improvement, and reſided a conſiderable time at Rome. On his return he viſited Paris, and often painted on the ſame canvas with Van der Meulen, though his ſtyle bears reſemblance to that of Wouvermans. Hugtenburg excelled in painting battles, encampments, ſieges, &c.; and was employed by prince Eugene to paint and engrave the battles and ſieges he ſo fortunately conducted. This artiſt not only characteriſed the different nations he repreſented by the coſtume, but by the general phyſiognomy of his figures.

He likewiſe etched a conſiderable number of plates in a ſlight, ſpirited ſtyle, with great freedom, and in a way which manifeſts the hand of a maſter. The figures, horſes, and other principal objects, are executed with peculiar feeling and ability.

The work which he executed from the pictures which he painted for prince Eugene is uſually bound up in a large folio volume, with hiſtorical explanations by M. J. Dumont. They were publiſhed at the Hague in 1725, on the frontiſpiece is inſcribed "Déſſeintes et gravées en taille douce, par le Sieur Jean Huchtenbourg." This work is curious and conſiderable, but is not conſidered as containing his beſt engravings; he likewiſe ſcraped mezzotinto a good deal, but his performances in that art are not ſo good as his etchings; and it is very difficult to find good impreſſions.

When this artiſt did not ſign his name at length, he ſubſtituted his initials, in the manner expreſſed in *Plate* IV. of thoſe uſed by the engravers of the Netherlands. The following are conſidered as ſome of his beſt engravings.

"Travellers halting before a Forge," in folio; "William III. reviewing his Army near Arnheim," in large folio; a ſet of eight oval prints, in 4to., repreſenting marches, encampments, battles, &c.; a ſet of four mountainous landſcapes with figures; "Hunters reſting," in a woody landſcape, in large folio; all from his own pictures. "A combat of Cavalry," in large folio, after Van der Meulen; another "Combat of Cavalry," dedicated to duke Charles Albert of Chevreuſe, in large folio; "The City of Liſle, inveſted by the French Army," on two large folio plates; "The taking of Dole," in large folio, on two plates; "The March of Louis XIV. and his Retinue, over the Pont-neuf to the Palace," in large folio; all after Van der Meulen. "The Battle between the French and Germans in Italy," in large folio, after D. Hoogſtraten; and "The grand Proceſſion of Horſes in Holland," dedicated to Frederic William, ſon of the king of Pruſſia, in large folio. Theſe two laſt are etched, and then harmoniſed with the graver, and are very capital performances.

Mezzotintos from his own Deſigns.—"Two Cavaliers marauding;" "Two Horſe Soldiers diſmounting before a Victualling Tent," both in folio; "A Halt before an Inn;" "Departure for Hunting;" "A Combat of Horſe Soldiers;" another "Combat of Cavalry;" and "The Imperial Cavalry fighting againſt the Turks," all in large folio.

Peter Schenck was one of thoſe who regarded engraving as a trade, or means of obtaining money, merely; and on whom it is fruitleſs to dwell. He was born at Elberfeld, A.D. 1645; became a printſeller of Amſterdam, and died at Leipſic in 1711.

While he continued to engrave, he was a mere workingman of induſtry. Sometimes he ſcraped mezzotinto portraits, and ſometimes he etched views; but both were very indifferently performed. Thoſe of his productions which are beſt entitled to notice, are the

Mezzotintos of Petrus Schenck, after J. P. Feuerling, in folio; another portrait of Peter Schenck, ſeated at table with his wife, in large folio; Martin Luther; Gottifried Keck, after D. Richter; Gerard Laireſſe; Philip Jacob Spener, theologiſt; John Oleraris; Peter de Witt, a divine, after Muris; Simon Schynvoet, an architect of Amſterdam; William Henry, prince of Orange; Charles XI. and Charles XII. kings of Sweden; buſt of the Virgin; "A Criminal confeſſing to a Monk;" "A young Woman confeſſing to a Monk;" "Death playing the Violin, and preſenting himſelf to a Man," inſcribed "Mortis ingrata Muſica," all of folio ſize.

John vander Bruggen was another who merged the artiſt in the tradeſman. He was born at Bruſſels, A.D. 1649; and worked for ſome time in his native country, but afterwards went to Paris, where he eſtabliſhed himſelf as a printſeller. In 1698 he publiſhed the works of La Fage, with the portrait of that artiſt engraved by himſelf in mezzotinto, after Largilliere.

There is a great number of mezzotintos by Vander Bruggen, which, though not entirely deſtitute of merit, are ſuch as do him no great honour as an artiſt. The mark which he frequently uſed will be found in our *Plate* IV. of thoſe uſed by the engravers of the Low Countries.

The following are the moſt important of his engravings. The portrait of himſelf after Largilliere; Antony Vandyke; and the portrait of Louis le Grand, all in folio. "The Gold weigher," after Rembrandt; "An old Woman weighing Gold;" "A Man ſeated, with a Goblet in his Hand;" A Man leaning againſt a Table, and a Woman behind him ſcolding;" "A Man ſeated under a Tree lighting his Pipe;" "A Man ſleeping, and another ſtanding near him;" "Cupid and Pſyche ſleeping;" a large ſkull, inſcribed "Memento mori;" "An old Man in a Public-houſe, with a Girl playing the Flute;" "A Party of Peaſants in a Public-houſe, ſmoking and drinking;" both the latter are after Teniers; and all are of quarto dimenſions.

Suſanna vander Bruggen was doubtleſs related to this artiſt, and engraved ſome few plates of no great merit, after Vandyke and Rubens.

John Luycken, or Luyken, was born at Amſterdam ſome time about the middle of the ſeventeenth century, and died in that city in the year 1712. He ſtudied the arts under Martin Zaagmoelen. Baſſan ſays of his prints, “we remark in them a fertility of genius, joined with great ſpirit, judgment, and facility of execution, he is the Callot, the Della Bella, and the Le Clerc of Holland.” But this is ſaying a great deal too much. He neither drew ſo correctly, nor etched in ſo clear and determined a ſtyle as either of thoſe diſtinguiſhed engravers. It is true there are few of his prints, into which he has not introduced a great number of figures, but the groups are ſeldom artfully managed; the lights, for want of harmony, and being too much ſcattered, confuſe the ſubject, and fatigue the eye. This is ſpeaking of them, however, only comparatively; conſidering them by themſelves they poſſeſs great merit.

He chiefly engraved after his own deſigns, and the moſt conſiderable of his works is the large bible, which was publiſhed by Montier in two folio volumes, and the following.

A ſet of “The Ten Commandments,” in 8vo.; a ſet of ſeventeen, of “The Hiſtory of Lapland and Finland,” in 4to.; a ſet of ſeventeen views, &c. which accompany the Eaſtern Travels of M. Thevenot, in 4to. The hiſtory of William III. king of England, in 8vo.; “The Republic of the Hebrews,” in twenty-eight plates, in 8vo. and 4to. “The Theatre of Martyrs,” from the time of Jeſus Chriſt, to modern times, in a ſet of one hundred and five plates, in 4to.; “The Prophet Jonas, preaching to the Ninevites,” in large folio; “The Aſſaſſination of Henry IV. of France,” in folio; “The Flight of the Reformers at the Revocation of the Edict of Nantes,” in large folio; “The Maſſacre of St. Bartholomew, or the Death of admiral Coligny,” a very capital print, engraved on two large folio plates.

Gaſpar, or Caſpar Luycken, was the ſon of John Luyken, mentioned in the preceding article, and was born at Amſterdam in the year 1660. He learned engraving from his father, and deſigned and engraved a conſiderable number of plates; but his works are neither ſo numerous nor ſo meritorious as thoſe of his father, whoſe ſtyle he imitated. Among them the following will probably be found moſt worthy of ſelection. “St. Francis Xavier preaching before the Emperor of Japan;” “The Jeſuit Miſſionaries obtaining Audience of the Emperor of China;” “The Emperor Joſeph I. receiving the Holy Sacrament;” “The Miracle of the Five Loaves,” all of large folio ſize; “The Twelve Months of the Year;” “The Four Seaſons;” and “The Grand Roman Cabinet;” all in folio.

Paul van Somer was born in Holland, A.D. 1649. He reſided during ſome time at Paris, and afterwards came to London. He etched, engraved, and ſcraped in mezzotinto, but his works in either art do him no great credit; among them the following are moſt worthy of attention.

“Tobit burying the Dead,” in large folio, from Sebaſtian Bourdon; “Moſes found in the Ark of Bulruſhes,” after Pouſſin; “The Baptiſm of our Saviour,” after the ſame painter, both in folio; “Nil placet, &c.” or the fable of the old man and his aſs, after Griffier, on a ſet of ſix folio plates.

From his own Compoſitions.—“The Holy Family;” “The Adoration of the Shepherds,” both in folio; “A Ruſtic Converſation of Four Peaſants,” in large folio. The four parts of the day, on 4to. plates, *viz.* “The Morning,” (Cephalus at the chace;) “Noon Day,” (Arethuſa bathing in the river Alpheus;) “The Afternoon,” (Diana and Acteon;) and “The Evening,” (Pyramus and Thiſbe.)

The two following are in *mezzotinto.* “The Counteſs of Meath,” after Mignard; and “An Officer and Girl in converſation,” both in folio.

John van Somer was born in Holland in the year 1640, and was probably related to Matthias van Somer, who, according to profeſſor Chriſt, engraved a ſet of landſcapes. John engraved in mezzotinto, and with the graver, but did not much exceed mediocrity. The following are ſome of his beſt productions. Antony Gregatus, profeſſor of theology at Heidelberg; Daniel Sachſe, theologiſt, both in 4to.; Charles Louis, elector of Bavaria; Michael Adriantſz, admiral of the United Provinces, a fine portrait, in large folio, from Du Jardin; “Three Peaſants drinking in an Alehouſe,” from J. Both; “Dutch Smokers,” after Oſtade; “A Dutch Concert,” from Teniers; “A Man filling his Pipe, and a Girl drinking,” from Gerard Terburgh, all in folio; “The Angels appearing to Abraham,” in large folio, from Laſtman; and “A Party of Pleaſure,” from his own deſign.

S. A. Van Lamſweerde was a native of Utrecht, born ſome time about the year 1650; but he appears to have been an artiſt of no great merit. He engraved portraits ſomewhat in the ſtyle of Suyderhoef, among which the following are moſt worthy of notice.

Francis Gomarius, a theologian of Bruges, in folio; Henry Alting d'Embden, a theologian of Heidelberg, in 4to.; Anna Maria Schurman, in folio; Cyprian Regnier, a juris conſulte, at Utrecht, after Gerard Duffeit; and Charles de Maets, profeſſor of theology at Utrecht, after Hendrick Bloemaert; both in large folio.

John Lamſvelt was born at Utrecht in the year 1660. He was probably a diſciple of Romain de Hooghe, whoſe ſtyle he has tried to imitate. His principal works are portraits, part of which he engraved for the hiſtory of Louis XIII., by Michael le Vaſſor, among which the following are the moſt important. A Head of Oliver Cromwell, in an oval of quarto ſize; John de Wit; Cornelius Pieterſzoon Hooft; George Caſſander; Hubert Duiſhuis, of Rotterdam; all rare and much ſought after by connoiſſeurs; and a large folio engraving of “The Siege of Tournay, by the duke of Marlborough and prince Eugene.”

John Verkolie was born at Amſterdam in the year 1650, and died at Delft in 1693. He became an artiſt owing to an accident he met with in his youth, which obliged him to keep his bed for three years, during which time he amuſed himſelf with copying pictures and drawings: he acquired the rudiments of perſpective from books, and he ſoon tried to paint in oil, without any other inſtructions. He afterwards became the diſciple of John Lievens, and ſtudied with aſſiduity the pictures of Van Zyle. Verkolie reſided at Delft, where he was obliged to employ great part of his time in painting portraits, but he likewiſe ſucceeded in hiſtorical and converſational ſubjects. He amuſed himſelf with ſcraping in mezzotinto, which was then but recently diſcovered; and the prints which he executed are much ſuperior to what might have been expected at ſo early a period. The following *Portraits* are ſome of his beſt productions in that art.

Himſelf, after De Leeuw, in 8vo.; Steffan Wolters, from P. Kneller, in quarto; Joſias van de Kapelle, a clergyman of Leyden; Cornelius van Acken, a clergyman of Delft; William Henry, prince of Orange; and Hortenſia de Mancini, ducheſs of Mazarin, after Lely, all in folio.

Various Hiſtorical Subjects, &c.—“Jupiter and Caliſto,” from G. Netſcher, (the companion to “A Shepherd and Shepherdeſs,” by G. Valck, from the ſame painter); “Venus and Adonis," from his own compoſition, companion to "Cephalus and Procris," engraved by Broedelet, after Gerard Hoet; "Venus and Cupid;" "Pan and Flora;" "A young Man and Girl converſing," from Ochtenvelt, all of folio ſize.

Nicholas Verkolie was born at Delft in 1673, and was the ſon of the preceding artiſt. He became the pupil of his father, and ſucceeded in painting hiſtorical ſubjects and portraits. He was alſo celebrated for his Indian ink drawings, which he finiſhed with great delicacy. Nicholas learned the art of mezzotinto ſcraping from his father, and practiſed it with ſtill more ſucceſs. The following are ſome of his beſt engravings.

Portraits.—Nicholas Verkolie, from a picture by himſelf; the painter drawing from a model; the amateur Moëlards with a folio, all in quarto; John Peter Zomer, a connoiſſeur, holding a print in his hand, from A. Booner. Some few impreſſions were taken from this plate, without the print, which is held by Van Zomer; but theſe are exceedingly rare; Martin van Bockelin, from his own picture; and Bernard Picart, after Nattier, all in folio.

Various, from his own Deſigns, and after other Maſters.—"The Holy Family," after A. vander Werff; "Diana and Endymion;" and its companion, "Bacchus and Ariadne," both in folio; "A Shepherd careſſing a Shepherdeſs," in large folio, all after G. Netſcher; "An Entertainment in a Garden," in folio, after J. B. Weninx; "Two Men drinking and ſmoking," after A. Matham, in large folio; "A Youth aſleep on a Girl's Lap," from his own deſign; "A young Girl and her Lover having their Fortunes told." "An old Man ſeated in a Garden, with a Girl, who holds a Miniature in her Hand," both in folio. Heads of a man and woman laughing; a lap-dog playing on a chair; and two dogs at play, all in quarto, very delicate engravings.

Solomon Savery was born at Amſterdam ſoon after the middle of the 17th century, and by ſome writers is ſaid, with great probability, to have reſided during part of his life in England. Under what maſter he ſtudied, if under any, is not known; but he handled his graver with a degree of vigour, feeling, and characteriſtic touch which proclaims original powers. The mechanical exactneſs and regularity of his hatchings, he, with great addreſs, rendered ſubſervient to his art of expreſſing the ſeveral ſurfaces which ſo beautifully diverſify the ample face of nature: his chiaroſcuro is ſufficiently powerful; and if the graver was not the ſole inſtrument of his art, he very rarely employed the point.

He produced a few hiſtorical ſubjects; but his chief excellence lay in portrait engraving, and he ſeems to have been partial to ſuch heads as were covered with hats, either becauſe he engraved the high-crowned hat, which was then in faſhion, with conſiderable ability, or becauſe he believed that ſo broad a maſs of darkneſs which theſe hats afforded, gave effect to his faces.

His principal *Portraits* are thoſe of doctor Camphuyſen, ſurrounded by an olive wreath, and three allegorical figures, after C. Caſleyn; Simon Epiſcopius, and Andrea Calvius, after Cuyp; Iſaac Saaly of Ziriczee; John Speed, the Engliſh chronicler, with his hat on, a very excellent plate; king Charles I. with a high-crowned hat, the face of which portrait is believed to have been taken from a picture by Vandyke, and the hat and the other accompaniments added by Savery himſelf; and Thomas, lord Fairfax, alſo with a hat on, all of folio ſize.

Hiſtorical Subjects, &c.—"Chriſt expelling the Money-lenders from the Temple," in large folio. A man's head with muſtachios and ſhort curly hair, both after Rembrandt. A grand entertainment given on the water, in honour of Mary of Medicis, after S. Vlieger, (which belongs to a ſet of engravings that were publiſhed at Amſterdam in the year 1638, and entitled "Medicea Hoſpes.") A grand proceſſion, in large folio, after M. de Jonghe; and a ſet of ſeventeen etchings, of which the ſubjects are taken from Ovid's Metamorphoſes, after F. Cleyn.

Thomas Wyck, Theodore Maes, Julius François, (ſurnamed *Horizonti*), Louis Deyſter, Charles de Moor, and Richard and John van Orley, were Dutch and Flemiſh painters, who lived at this period, ſome of whom performed a few etchings, and others of whom ſcraped a few mezzotintos.

The etchings of Wyck are ſmall, but free and delicate. Fourteen of them, which were in the poſſeſſion of Mariette, and were ſold at his auction for three hundred and ſix livres and ſix ſous, are probably all that Wyck ever produced. They conſiſt of paſtoral and military ſubjects, and are all from his own compoſitions.

In thoſe of Maes, much of painter-like intelligence may be diſcerned. "The Holy Virgin and Infant Chriſt, attended by two Angels;" and a ſet of ſmall plates, of cavalry ſkirmiſhing, &c. are all that we know of from the needle of this artiſt.

The etchings of Horizonti, like thoſe beautiful water-colour pictures with far diſtant and ſweetly-painted horizons, from which he obtained his cognomen, are landſcapes in which Tivoli and the Campania of Italy are frequent features.

Deyſter filled up ſome of his hours of ſecluſion with etching and mezzotinto ſcraping; and his productions in theſe arts partake of the character of his genius as a painter, of which we have already treated. Among them is a ſet of four landſcapes, in rather a grand ſtyle, of quarto ſize, which are rare and much eſteemed.

The excellence of De Moor lay in portraiture. He etched, in a ſpirited manner, the heads of his maſter, Gerard Douw, Van Goyen, and Mieris, and he alſo, according to Baſſan, ſcraped a few plates in mezzotinto, of which we know not the ſubjects.

Richard van Orley was born at Bruſſels, A.D. 1652, and died in the ſame city in 1732. He learned the elements of art of his father, who was a landſcape painter of no great eminence. He began by painting miniatures; but feeling a deſire to gain a more elevated ſtation in art, he ſtudied in the ſchools of deſign with great aſſiduity, and became an hiſtorical painter of no mean talent.

He likewiſe executed a conſiderable number of etchings in a ſlight coarſe ſtyle, and which, in ſome inſtances at leaſt, are defective in point of drawing; among them, the following are the moſt meritorious.

"The Marriage of Joſeph and the Virgin," after Lucas Giordano, in folio; "The Fall of the rebel Angels," a large folio print, from Rubens; "A drunken Bacchus, ſupported by Satyrs," from the ſame painter; and "Vertumnus and Pomona," all in folio. A ſet of twelve, in octavo, from Guarini's "Paſtor Fido." A ſet of twenty-eight folio plates, lengthways, taken from the New Teſtament, from drawings by John van Orley.

John van Orley was the brother of Richard, and did not diſtinguiſh himſelf leſs as an artiſt; he frequently made drawings from pictures for the latter to engrave after; and likewiſe aſſiſted in engraving the ſet from the New Teſtament, after his own deſigns.

John Gole was born at Amſterdam about the year 1660. He worked with the graver in ſtrokes, and ſcraped ſeveral mezzotintos. His works are numerous, but not very eſtimable. On the whole, thoſe appear to be the beſt which are executed with the graver. A few of the beſt of his engravings, in each manner, are ſpecified below.

Line Engraving.—Charles XI., king of Sweden; the ducheſs de la Valliere; the unfortunate Grand Vizier; Kara Muſtapha; Mahomet IV., emperor of the Turks; Abraham Hellenbrock, a clergyman; the head of a man of letters, in an oval; Nicolas Colvius, a clergyman of Amſterdam, after B. Vaillant, all of folio ſize.

Mezzotinto Engravings.—Bernard Somer; John Oyers; and Jacob Gole (juris conſulte), the latter after D. Plaes; George Auguſtus, prince royal and elector of Brunſwick, after Hirſman; Charles III. king of Spain; admiral Van Tromp; Charles, landgrave of Heſſe-Caſſel; Balthaſar Becker, author of the Enchanted World; "Peaſants ſmoking round a Fire," after Oſtade. "A Group of three Peaſants in an Ale-houſe, one of whom plays the Violin," after Brouwer; "The Tooth-drawer," after Teniers, all in folio; "The School-maſter," after Hemſkerck; and "Heraclitus deploring the Miſery of human Nature," after C. Duſart, both in quarto.

John Groenſvelt, or Groenvelt, was born at the Hague in the year 1650. He etched a conſiderable number of plates, after Berghem, Van Goyen, Lingelbach, and other maſters, which are much eſteemed; and a few portraits, in which the faces are almoſt entirely ſtippled. His general ſtyle of manual execution is neat, but ſomewhat ſtiff: and the following are ſpecified as being ſome of the beſt of his engravings.

"Dorothea, counteſs of Sunderland," after Vandyke, in folio; "A Girl with a Cat," after Bloemaert, in quarto; "The Adoration of the Eaſtern Kings," after P. Veroneſe; "Chriſt before Pontius Pilate," after Andrea Schiavone; and, "A Man aſleep on a Tub," all of folio ſize; a ſet of ſix landſcapes, after Berghem; and another ſet of four, after the ſame maſter, of quarto ſize, the ſubjects of which are various paſtoral incidents.

Arnold Houbraken was born at Dordrecht in the year 1660, and died at Amſterdam in 1719. He ſtudied under various maſters, and laſtly under Samuel de Hoogſtraeten; he painted portraits and hiſtorical ſubjects; and is the author of a work in the Dutch language, entitled "The Great Theatre of the Dutch and Flemiſh Painters, by Arnold Houbraken, with their portraits, engraved by himſelf." According to our countryman Strutt, Houbraken came into England, and made drawings from the pictures of Vandyke, which were afterwards engraven by Peter van Gunſt, and he received one hundred guilders for every drawing. He executed ſeveral ſlight etchings, with great intelligence, from his own deſigns; which are much ſought after by amateurs. His heads of the painters are engraven, with much taſte, in ornamental borders, with ſeveral on one plate; and the following are likewiſe by him: A ſet of etchings of boys and vaſes; "Vertumnus and Pomona;" an emblematical ſubject, repreſenting three women looking at a child in a ſort of baſket, or cradle, encircled by a ſerpent; and "The Diſciples at Emmaus," in the ſtyle of Rembrandt; all in quarto, and from his own compoſitions.

James, or Jacob Houbraken, was an engraver of admirable talent, to whom England is largely indebted for perpetuating, and diffuſing through Europe, the portraits of ſeveral of her moſt illuſtrious poets, ſtateſmen, and warriors. He was born at Dordrecht in the year 1698, and was the ſon of Arnold, of whom we have treated in the preceding article. He dated many of his productions from Amſterdam, which ſeems to afford evidence of his long reſidence there, but he died in his native city in the year 1780.

Houbraken had no other maſter than his father, but his genius, and the ſtudy which he beſtowed on the beſt portraits of Nanteuil and Edelinck, ſuperſeded inſtruction, or rendered it ſuperfluous. Strutt thinks, and with much of the appearance of reaſon, that he formed his ſtyle of engraving more particularly, by an attentive ſtudy of that portrait of Le Brun, which is engraved by Edelinck, and prefixed to his battles of Alexander. However this may have been, his very high rank, as an engraver of portraits, was ſoon acknowledged through Europe, and has called forth the juſt encomiums of Watelet, of Gilpin, of Martini, and of Strutt. In the collection of portraits of illuſtrious men, which was publiſhed in London by J. and P. Knapton, which perhaps, on the whole, may be eſteemed the principal work of Houbraken; the ſurrounding accompaniments are ſaid to have been deſigned and engraven by Gravelot. Theſe accompaniments are etched with conſiderable taſte and energy, and form an harmonious and very agreeable contraſt, to the rich and deep-toned ſoftneſs and more elaborate execution of the portraits themſelves, to which they are kept in due ſubordination. In ſome of his foreign productions, however, Houbraken has himſelf oppoſed, in a ſimilar manner, though not perhaps with quite equal ſucceſs, the pictureſque wildneſs and roughneſs of etching, to the more poliſhed ſweetneſs and mellowneſs of his dry needle and graver, and even in the laced ruffs and other ornamental parts of the dreſſes of his Engliſh portraits, he has contrived to mingle a ſmall portion of etching with enviable ſucceſs. But his chief ſtrength lay in the truth and taſte of his drawing, and the vigour and delicacy with which, as occaſion required, he handled his graver. Sometimes, in the ſame production, may be beheld the boldeſt courſes of mellow lines,—as in the armour of his portrait of the marquis of Montroſe, after Vandyke,—blended and harmonized, with admirable addreſs, with the utmoſt ſweetneſs and delicacy of execution in the face and hair.

The monarch, or parliament, who could prevent engravers from affixing their names to any other than their own productions, would probably perform a moſt eſſential ſervice to engraving *as an art.* The demands of commerce will have the matter otherwiſe. The cupidity of gain, in all trading places, ſullies the purity of an honourable love of fame, and damps the ardour of diſintereſted exertion. In the age and country in which it was the fortune of Houbraken to be placed, he was almoſt of neceſſity ſubject to this baneful influence: and his name accordingly appears to ſome engravings that are certainly in parts, if not altogether, the productions of inferior men. He who would meaſure the true ſtandard of the merits of this diſtinguiſhed artiſt, or form a juſt eſtimate of his attainments, ſhould look at early impreſſions, (not ſuch as are now common in the London ſhops, and taken from the retouched plates,) of the portraits of ſir Thomas More, Hambden, Schomberg, the earls of Arlington and Bedford, the duke of Richmond, and ſome others in the ſame valuable volume.

Strutt is more critically obſervant in commenting on the works of Houbraken, than in moſt other parts of his biographical dictionary. He details the intereſt with which he regarded theſe portraits, with feeling; and exemplifies the compariſon which he made between Houbraken and thoſe admired portrait engravers who ſtand foremoſt in the ſchool of France, by an elegant analogy.

After admiring the ſoftneſs and delicacy of execution, good drawing, and fine taſte, which are diſplayed in the works of Houbraken, he ſays, "If his beſt performances have ever been ſurpaſſed, it is in the maſterly determination of the features, which we find in the works of Nanteuil, Edelinck, and Drevet: this gives an animation to the countenance, more eaſily to be felt than deſcribed. From his ſolicitude to avoid the appearance of an outline, he ſeems frequently to have neglected the little ſharpneſſes of light and ſhadow, which not only appear in Nature, but, like the accidental ſemitones in muſic, raiſe a pleaſing ſenſation in the mind, in proportion as the variation is judiciouſly managed. For want of attention to this eſſential beauty, many of his celebrated productions have a miſty appearance, and do not ſtrike the eye with the force we might expect when we conſider the excellence of the engraving."

The biographer here certainly touches his inſtrument with a finger of exquiſite feeling: yet, as the wild muſic which ſhould accompany and aid the varying ſentiment of mental emotion, is of a diſtinct character from that Lydian meaſure and thoſe dulcet tones, that

———" Sooth the ſoul to pleaſure;"

ſo Strutt muſt not be ſuppoſed to mean that one particular ſtyle of engraving is ſuited, in preference to all others, to portraits of every kind, and engraved after whatever painter. The preſent writer entertains little doubt but that the ſemi-demi diſtinctions which he perceives between the ſtyles of different engravers, analogous to thoſe which are noted in muſic, will one day be ſo generally felt and underſtood by profeſſors, and finally by the public at large, as to become the ſubject of critical admeaſurement and animadverſion; and when that day of pleaſure ſhall arrive, the ſoftneſs and ſweetneſs, and delicate indefinity which addreſſes the fancy rather than the ſenſe, which confers that exquiſite melting roundneſs to which female and infantile beauty is ſo much indebted; which may be traced in the ſtyle of Houbraken, and which, in our own times, has played among the zephyrs, the loves, and the graces of Cipriani and Bartolozzi, will be as much admired, when properly introduced, as the more energetic touches of manly character and expreſſion, or "little ſharpneſſes" which our Engliſh critic has deſcribed with a feeling ſo technically juſt.

Compariſons might, doubtleſs, be ſeverally inſtituted with advantage to our critical knowledge of portrait engraving, between the Dutch artiſt and thoſe great ornaments of the French ſchool whom Strutt has named, but it would perhaps lead us into too wide a field for the preſent occaſion. To compare him with Drevet alone: his works, though leſs elaborate, are ſcarcely leſs highly finiſhed, and are more mellow and free. Drevet ſeemed always approximating toward an ideal ſtandard of perfection in which exactitude ſhould blend with truth and the graces, and the peculiar taſte, and even the redundant ornaments of Rigaud, the portrait painter of a ſhowy and luxurious, rather than a taſteful age, are ſeduouſly rendered: Houbraken, diſguiſing every appearance of ſolicitude, is always maſterly and free, and always like the painter after whom he works, whether it be Holbein, Vandyke, or Lely. Drevet tranſcended all his predeceſſors, and left poſterity to wonder at his powers of execution, and deſpair of attaining them: Houbraken is more practically meritorious; when we ſee one of his portraits, we believe, as we admire it, that the ſame hand and mind might have accompliſhed many, whereas, when we behold the St. Bernard, or archbiſhop of Paris, of Drevet, we think that ſcarcely leſs than a life could have been beſtowed on them, and that he who has engraved theſe plates has done enough for one man, if he has done no more. If Drevet appears to defy competition, he does ſo with a ſtretch of careful attention, and a ſhare of manual and viſual power, which we cannot but admire, whereas Houbraken is always eaſy, and always ſucceſsful, when he does not allow a ſubſtitute to handle his graver. He appears, in his works, to have lived to be eminently and extenſively uſeful; the ſpectator cannot regard one of his portraits, without ſuppoſing that he muſt, or knowing that he might, have done many; becauſe he perceives that the artiſt knew the point where an high degree of excellence might, with practical advantage, ſtop ſhort of the elaborate preciſion, and recondite beauty of executive detail, which is diſplayed in the portraits of Drevet.

The following liſt contains the whole of the works of Houbraken with which we are acquainted.

Portraits in Folio.—A half-length of himſelf, after Quinkhard, dated 1749; Arnold Houbraken, the father of Jacob; William VIII. landgrave of Heſſe Caſſel; Jacob van Hoorn, who married, for the fourth time, at the age of ninety-ſeven, a young woman of twenty-three; and its companion, his laſt wife, Jacoba van Selſted; Albert Seba, of Erzeel, in Ooſtfriſe, member of the Academy of Natural Curioſities at Amſterdam; John Burmann, doctor of medicine; Francis Burmann, of Utrecht, theologian; Guſtavus William, baron of Imhof; Peter Muſchenbroeck, profeſſor of medicine at Leyden, all after Quinkhard; George, lord Anſon, after J. Wanderlaar; Ferdinand van Collen, a burgomaſter of Amſterdam; Gerard Arnoult, a burgomaſter; Herman Alexander Roell, theologian, both from the ſame painter; Peter Burman, profeſſor at Utrecht, after Herman vander My, or Myn; Jerome Gaubius, a phyſician; John Conrad Rucker, a juris conſulte, both from the ſame painter; George I. king of England; Thurlow, ſecretary to Oliver Cromwell; and Thomas, lord Fairfax, both after Cooper; Catherine Howard, queen of Henry VIII.; ſir Thomas More, the chancellor, both from Holbein, the latter a very celebrated engraving; William James Sgraveſande, a mathematician, after Vandyke; William Ruſſell, duke of Bedford, from the ſame painter; George Villiers, duke of Buckingham, after C. Johnſon; Sigbert Havercamp, profeſſor at Leyden, after F. Mieris; Mary Stuart, conſort of William III. prince of Orange, after G. Netſcher; John de Witt, grand penſionary of Holland, from C. Netſcher; John Rodolphus Faeſch, of Baſle, from J. R. Huber; lieutenant-general Talmaſh, after ſir Godfrey Kneller; Anthony, duke of Shafteſbury, after ſir Peter Lely; Mary Louiſa, of Heſſe Caſſel, from B. Accama; Henrietta Wolters, from a picture by herſelf; Cornelius Frooſt, the painter of Amſterdam; Jacob Compo Weyerman, from C. Frooſt; Nicholas Verkolie, from a picture by himſelf; Herman Schyn, ſchoolmaſter, from Henrietta Wolters, called Van Peene, all in quarto; Chriſtian Gottlieb Glafey, after P. Salice; John Mannekemolen, after Schouman; the czar, Peter the Great; William VIII. landgrave of Heſſe Caſſel; and William, prince of Orange, all of folio dimenſions.

Hiſtorical, &c. after C. Frooſt.—"The Grandmother," from the cabinet of Pinto, at Amſterdam, in large folio; "Avarice deceived," from the cabinet of Vander Mark, of Leyden, in folio; "The Feſtival of St. Nicholas," from the cabinet of Muilman, at Amſterdam; "The Cymbal Player," a grand compoſition, from the cabinet of Verſchuring; "The Fair at Amſterdam," from the cabinet of Neyman; "Tartuffe, the Impoſtor," from the cabinet of Braamcamps, all in large folio. And the two following for the Dreſden gallery; "Daniel Barbaro," a Venetian nobleman, after P. Veroneſe, in folio; and "The Sacrifice of Manoah," in large folio, after Rembrandt.

John van Vianen, of Amſterdam, was alſo a portrait engraver, but of talents very inferior to thoſe of Houbraken. He was born in the year 1660. He drew portraits from the life in a manner which has the reputation of accuracy, but his ſtyle of engraving, though neat, is taſteleſs.

Among his portraits are thoſe of John Turretin, of Geneva; Auguſtus Pfeiffer, of Lubec; and Simon de Vries, from drawings by Vianen himſelf; and Frederic William I. king of Pruſſia, in cameo, with ornamental accompaniments, after J. Goerée, all of folio dimenſions.

Vianen alſo engraved and publiſhed ſeveral views of his native city of Amſterdam.

Wilhelm, or William Swidde, was born in the province of Holland, A.D. 1660. He probably ſtudied under one of the Viſſchers. Soon after his pupillage he travelled to Sweden, where he obtained patronage, and where he probably paſſed the remainder of his life.

He both drew and engraved landſcape in a very pleaſing ſtyle, in which delicacy is united with ſpirit, and his name and works have the honour of deſcending to poſterity with thoſe of Puffendorf, for the firſt edition of whoſe life of Charles Guſtavus, of Sweden, Swidde produced the engravings, and alſo for "Suecia Antiqua et Hodierna."

The reſt of his prints are generally found in ſets, of which there is one, of twelve views of towns and cities in the province of Frieſland; another ſet of ſix beautiful engravings, entitled "Verſcheyde landſchapjes ſeer aardig getekent door D. Dalens, geetſt door W. Swidde, et uytgegeven door N. Viſſcher;" and another ſet of ſix mountainous landſcapes, with ruined edifices, cattle, and figures, in ſmall folio, alſo after Dalens.

John de Leeuw, the portrait-engraver, is worthy of ſmall notice. He was born at the Hague ſoon after 1660, and was probably deſcended from William de Leeuw, of whom we have already treated.

In conjunction with John Lamſvelt, he engraved the portraits for "The Hiſtory of Louis XIII." by Michael le Vaſſor. He alſo engraved the portrait of John, duke of Marlborough, which is inſcribed with the motto "Veni, Vidi, Vici," in folio; a very neat portrait of Karolus Niellius, in quarto; Joſeph Juſtus Scaliger; and Cowley, the poet.

Robert van Audenaerd, or Oudenord, was born at Ghent, A.D. 1663. The name is provincial, and means literally *of Oudenord*, of which place the father of our artiſt is believed to have been a native.

Robert applied himſelf to the ſtudy of art at a very early period of life, under the direction of Van Cleef, and other Flemiſh maſters. He afterwards travelled to Rome for improvement, and was received into the Academy of Carlo Maratti.

At this period he is ſpoken of with praiſe as a painter; but we ſhall here conſider him only as an engraver. His early progreſs in the latter art, was interrupted by an act of profeſſional indiſcretion, which is thus related by Strutt.

"He frequently uſed to amuſe himſelf at his leiſure with the point; and being pleaſed, as it ſhould ſeem, with a ſketch of his maſter, repreſenting the marriage of the Virgin, he etched a plate from it, of which Carlo Maratti knew nothing, until the impreſſions being circulated about, he accidently ſaw one of them in a print-ſhop, and by enquiry, ſoon diſcovered its author. Audenaerd felt ſeverely the effects of his reſentment, which he carried to ſuch an height, that he forbade him to approach his ſchool, declaring he would never ſee his face again." Maratti, however, though warm in his reſentment, was not implacable, and the preſent writer would willingly aſcribe the reconciliation which afterward took place between the maſter and diſciple, to the interceſſion of Giacomo Frey.

Frey (as we have related in our biography of that very diſtinguiſhed artiſt), was the liberal friend and fellow ſtudent of Audenaerd, and with the energy and indiſcretion, poſſeſſed the generoſity, of genius; every principle of ſympathy muſt, therefore, have operated with him in obtaining the forgiveneſs of his maſter, and the return of his friend.

It ſeems not improbable that the aſſiduity of Audenaerd was quickened by this occurrence, for he ſoon made ſo great progreſs in engraving, that Maratti was extremely pleaſed, poured forth his inward feelings reſpecting his art, ere they were mellowed into principle, in the preſence of his two favourite pupils; and many of his beſt pictures were, at his own inſtance, put into the hands of Audenaerd to engrave. In particular, it was by his recommendation, which has ſince been perceived to have its foundation in the ſoundeſt theory, that the two fellow-ſtudents learned to incorporate ſo large a portion of etching as we behold in their hiſtorical prints, with the work of the graver.

On this point, Strutt judiciouſly ſays, "the plates which were done by this artiſt entirely with the graver, are not equal, in my opinion, to thoſe where he alſo uſed the point: they are cold and deſtitute of effect, and often, from his great ſolicitude to avoid an outline, his draperies appear heavy, and want ſharpneſs in the folds. The ſame heavineſs appears alſo in his heads and other extremities, and all the naked parts of the figure in general, as I think, will readily be allowed on examination of that, which repreſents "The Aſſumption of the Virgin," from Carlo Maratti, a middling-ſized upright plate, with this inſcription, "Quaſi aurora conſurgens;" which, if compared with the ſlight etching of "Hagar and Iſhmael," from the ſame maſter, I think the ſpirit of the latter will well repay the want of that neatneſs which is found in the former. Audenaerd certainly poſſeſſed great knowledge of the human figure, and his drawing is ſeldom incorrect."

During his ſtay in Italy, cardinal Barbarigo, with becoming regard for the fame of his anceſtry, engaged our artiſt to engrave the portraits of the diſtinguiſhed men of that family, with emblematical accompaniments.

The work conſiſts of one hundred and ſixty-five plates, and for ſome years remained imperfect on account of the death of the cardinal, but at length the five plates which were wanting to its completion, were engraved at the expence of one of his deſcendants, and the work appeared at Padua, in large folio, accompanied by certain Latin poetry, in the year 1762; ſince which period it has been ſold at the Barbarigo palace, at the price of twelve ſequins.

After reſiding ſeventeen years in Italy, Audenaerd returned to his native city, where he died in 1743, being fourſcore years of age. We ſubjoin a liſt of his beſt engravings.

Portraits.—Cardinal Sacriſſanti; cardinal Turuſi; and cardinal Ottoboni, all from J. B. Gauli; cardinal Francis Barbarini, after Carlo Maratti; cardinal Henry de la Grange d'Arquien, after Deſpontes; cardinal Joſeph d'Archinto; cardinal Andrea di Santa Croce, both from Joſeph Paſſeri; and father Francis Caraccioli, worſhipping the ſacrament, after And. Procaccini, all of folio ſize.

Hiſtorical, &c. after Carlo Maratti.—"Hagar in the Deſart;" "Abraham offering his Son Iſaac;" "Abraham's Servant meeting Rebecca;" "David with Goliah's Head;" "The Celebration of the Victory of David;" "Bathſheba at the Bath;" "The Annunciation;" "The Adoration of the Magi," an etching; "The Flight into Egypt;" "A Repoſe during the Flight into Egypt," all in folio; "Chriſt on the Mount of Olives," in large folio; "Chriſt on the Croſs;" "The Body of Chriſt on the Knees of his Mother," accompanied by St. John and the holy women; "The Death of the Virgin;" "The Aſſumption of the Virgin," after a picture in the cathedral of Urbino, all in large folio; "The Death of St. Joſeph," an etching in folio; "The Virgin diſtributing the Roſary to the Nuns," commonly called "Our Lady of the Roſary;" "The penitent Magdalen;" "The Martyrdom of St. Blaiſe;" "St. Anthony of Padua kiſſing the Foot of the Infant Saviour;" "St. Philip of Neri;" "James I. king of Italy, received among the Gods;" "The finding of Romulus and Remus," all in large folio; "Daphne purſued by Apollo," after a picture in the cabinet of the king of France, on two large plates.

Hiſtorical, &c after various Italian Maſters.—"The Nativity of our Saviour," after P. da Cortona, in large folio; a ſet of five etchings from "The Life of St. Bibiene," the fourth and fifth are from ſtatues by Bernini, the remainder from P. da Cortona; a group of "Atalanta and Hippomene," after Bernini; "The Rape of the Sabines," from John de Bologna; "St. de Facunda," after Hiac. Brandi, all in folio; "The Birth of the Virgin," from Annib. Caracci; "The Flagellation," and "Supplication of St. Andrew," both in large folio; and "St. Andrew tranſported to Heaven," in folio, all from Dominichino; "The Holy Family, with St. Luke painting the Portrait of the Virgin Mary," after M. A. Franceſchini of Bologna; "The Anger of Achilles," a large engraving on three plates, dedicated to pope Innocent XII., and after J. B. Gauli; and a very rare and large engraving of an allegorical theſis, in which the ſame pope appears ſeated on a throne, or in the chair of St. Peter, overcoming hereſy, &c.: it alludes alſo to the converſion of Frederic Auguſtus, and contains medallions of that prince and queen Chriſtina of Sweden.

Arnold van Weſterhout was born at Antwerp in the year 1666. After learning the rudiments of engraving of his father, he journeyed to Italy, and remained for ſome time at Florence, ſtudying his art under the patronage of the archduke Ferdinand, from whence he removed to Rome, in which metropolis he remained till the year 1730, which was that of his death. His plates are executed with the graver only, in a neat, clear ſtyle; but his chiaroſcuro is feeble, and the outlines of his figures are not always correct. He engraved a conſiderable number of plates from his own compoſitions, and ſome few after other maſters, among which the following are moſt worthy of attention.

Portraits.—Michael Angelo Zamburinus, ſuperior of the Jeſuits, after Odati; Julius de Arrighettis, ſuperior of the order of the Servites, after Dio. Godin, both in 4to.; cardinal James Antony Meriga, after L. David; and prince Roſpoli, in an oval, from the ſame painter, both in folio.

Hiſtorical, &c. after various Maſters.—"St. Peter Nolaſque borne through the Clouds by two Angels," and "Victory," both from his own compoſitions; a female, with a unicorn, in a landſcape back-ground, after Caracci, in 4to.; "The Deſcent from the Croſs," after Daniel de Volterra, in large folio; "The Virgin and Child," after Carlo Maratti; "St. Paul preaching at Athens," after J. B. Lenardi; "The Muſes protecting the Monuments of fine Art from the Ravages of Time," all in folio, from the ſame painter; "The Elevation of Virtue, and Depreſſion of Vice," dedicated to Lazari Pallavicini, in large folio; "A Woman kneeling, crowning an Eagle, accompanied by Pegaſus," perhaps the muſe of Pindar, after S. David, in folio.

Peter van Gunſt was born at Amſterdam in the year 1667. This artiſt poſſeſſed infinitely more patience than good taſte. He worked with the graver only, in a ſtyle which ſeems evidently formed upon the works of the Drevets. His firſt and ſecond courſes of lines are equally neat, and equally powerful, which gives them a cold, ſilvery effect. The folds of his draperies, though not ill drawn, are marked too harſhly, eſpecially upon the outlines of the lighter parts of them. His fleſh is generally extremely neat, and finiſhed with ſmall dots; but the lights are too much covered, which makes them appear heavy and laboured; and he drew but incorrectly. His portraits are by far the beſt, as well as the moſt numerous of his works; but they are, in a great meaſure, liable to the ſame objections as his hiſtorical ſubjects. The following are ſelected from his works, as being of the moſt importance:

Portraits.—Urbain Cherreau, from John Petitot. This is believed to be the only print engraved after that maſter, who was a celebrated enamel painter. Cornelius de Witt; Charles de St. Evremond, after Parmentier, all in 4to.; Balthaſar Bekker of Amſterdam, author of the Enchanted World, after Webber; Jahacob Saporteu, a famous rabbi of Amſterdam; Francis Valentine of Dordrecht, an eccleſiaſtic, after A. Houbraken; Frederic Dekker, doctor of medicine at Leyden, after C. de Moor, all of folio dimenſions; Salomon van Til, theologian, from the ſame painter, in large folio; Hero Siberſma, a clergyman of Amſterdam, from Boelaud; John William Triſo, prince of Naſſau, after B. Vaillant; Boris, prince of Kurakin, miniſter of the Ruſſian ſtates, after Kneller; Didier Eraſmus of Rotterdam, after Holbein; Mary, queen of England, after Vander Werff; Mary Stuart, queen of Scotland; Frederic, palatine, king of Bohemia; Elizabeth, his queen; James I. of Great Britain; Hugh Latimer, biſhop of Worceſter; Francis Junius, painter and author, all after Vander Werff; head of William III. of England, after J. Brandon, all of folio ſize; Charles II. of England, after F. Stampart, in large folio; John Churchill, duke of Marlborough, after Vander Werff; a ſet of ten portraits, of Charles I., his queen, and the Engliſh nobility of both ſexes of his court, whole length figures from Vandyke; and a ſet of nine, of "the Loves of the Gods," after Titian, all in large folio. The ſame ſet was engraved in mezzotinto by J. Smith.

Bonaventura Overbeck, ſurnamed *Romulus*, was born at Amſterdam in the year 1667, and died in the ſame city in 1706. He was the diſciple of G. Laireſſe, and publiſhed three folio volumes, (entitled "Reliquiæ antiquæ Urbis Romæ,") of the antiquities of Rome; to which city he travelled three times, to make the neceſſary ſtudies from nature, after which his plates were etched: and hence he obtained the cognomen of Romulus. His engravings are much admired for their firmneſs of ſtyle, and judicious diſtribution of light and ſhade, and were publiſhed at Rome in the year 1709; but preſumptively there was an earlier edition.

Iſaac Moucheron was likewiſe a native of Amſterdam, and born in the year 1670. He was the ſon of Frederic Moucheron, an admirable landſcape painter, of whom he learned the rudimental principles of art; but at the age of twenty-four, travelled to Rome for improvement, where he made a great many drawings of Tivoli, and other places in and about Rome. After his return to Amſterdam, he ſoon became known by his excellent landſcapes, enriched with figures and animals, which are held in the higheſt eſtimation. This artiſt executed a conſiderable number of etchings, in a very delicate ſtyle; the moſt important of which are a ſet of twenty-ſix folio plates, entitled "Views of

Heemſted, in the Province of Utrecht, drawn and engraved by J. Moucheron, and publiſhed by the Widow of Nicholas Viſſcher, with the Permiſſion of the States General." They are accompanied with French and German letter-preſs. Four garden views, with ruins and figures in the antique ſtyle; another ſet of four, of the ſame character, in large folio, from his own drawings; four landſcapes, with buildings and figures, entitled "Einigé Landſchapen, geſchildert door G. Pouſſin in Romen, in t'Koper gebracht door J. Moucheron in Amſterdam," in folio; and a landſcape, mentioned by Baſſan, of which we know neither the title nor deſcription.

Matthew Pool was born at Amſterdam in the year 1670, but ſtudied engraving at Paris, where he reſided for ſome years. He afterwards returned to his native country, where he married the daughter of Barent Graat, and engraved a conſiderable number of plates after various maſters, in a ſtyle reſembling that of Bernard Picart. The moſt important of his engravings are as follows: Petrus Hogenbetius, phyſician and poet; Barent Graat, the father-in-law of our artiſt; "Jupiter ſuckled by the Goat Amalthea," after B. Graat, all in folio; "Cupid caught in a Net by Time," after Guerchino, in an oval; a bacchanalian ſubject, after Pouſſin; a ſet of twelve, after Rembrandt, all in 4to.; a ſet of one hundred and three, entitled "The Cabinet of the Art of Sculpture, by Van Boſſuet, engraven by M. Pool, from the Drawings of B. Graat," in folio; and the three large burleſque repreſentations of the ceremonies practiſed by the Dutch painters at Rome, on the reception of a member into the ſociety, called "Schilderbent," from drawings by Barent Graat, after the original pictures by Dominique van Wynen, all in large folio.

James Coelmans was born at Antwerp in the year 1670, and died at Aix, in Provence, in 1735. He was the diſciple of Cornelius Vermeulen, and was invited to Aix by M. de Boyer d'Aguilles, to engrave his collection of pictures, in conjunction with Sebaſtian Barras. This ſet of engravings was finiſhed A.D. 1709, but was not publiſhed till 1744. It is the moſt conſiderable, and the beſt of the works of Coelmans, though the plates are executed chiefly with the graver, in a dark heavy ſtyle, deſtitute of harmony.

The drawing of the naked parts of the human figure is defective, and the expreſſion of the heads is likewiſe but poor. The ſet of engravings above mentioned, conſiſt of one hundred and eighteen, from which the following are ſelected as being the moſt important.

Portraits.—Donna Olympia Maldachini; the niece of pope Innocent X. from a picture by Joſephin; the miſtreſs of Alexander Varotari, ſurnamed Veroneſe, from a picture by that painter, both in quarto; a head of Paul Veroneſe, painted by himſelf, in folio; Conradus Ruten, from Bronkhorſt, in quarto; Francis de Malherbe, after Finſonius Belga; Vincent Boyer, comte d'Aguilles, &c. from a picture by le Grand; and John Batiſta Boyer, comte d'Aguilles, &c. after Hyacinthus Rigaud, all of folio dimenſions.

Hiſtorical, &c.—"The Holy Family," with a landſcape back-ground, from F. Maſſoli Parmenſis, in large folio; "St. Dominique paſſing the Holy Writings through the Fire, without damaging them," after Fr. Vanni; "The firſt Interview of Rachael and Jacob," after Michael Angelo; and its companion "Laban recompenſing Jacob with Rachael," from the ſame painter; "Jacob quitting Laban," a fine compoſition, after Caſtiglione; a very rich compoſition of muſicians, dancers, drinkers, &c. ſurrounded with whatever can add to the luxury and ſupport of mankind, inſcribed "Omnia vanitas," from the ſame painter; "Diana and Actæon," from Ottovænius, all of large folio ſize; "Lot and his Daughters flying from Sodom," after Rubens, in folio; the interior of a Gothic church, with figures, after Steenwyck, in quarto; "A Satyr drinking from a Vaſe, which is ſupported by a Cupid," accompanied by a nymph, who ſeems to ſay, that is enough! and is probably intended for Temperance, after Pouſſin; "The Martyrdom of St. Bartholomew," after Seb. Bourdon; "Mount Parnaſſus," a rich compoſition, from Euſtace le Sueur, all in large folio; "The Flight into Egypt," after P. Puget; "The Murder of the Innocents," from Claude Spierre, both in folio; and a head of "The Holy Virgin," after Seb. Barras, in large quarto.

Albert Haelwegh was a native of the Netherlands, and born about the year 1670. In 1690, he reſided at Copenhagen; but was afterwards invited to Denmark, where he engraved a conſiderable number of portraits, in a ſtiff, dark ſtyle, but which, for ſome reaſon with which we are not acquainted, are collected with ſome degree of avidity by the foreign connoiſſeurs. Of the works of Haelwegh, the following are moſt worthy of notice; Louis, landgrave of Heſſe Caſſel, from S. Duarte; Joachim de Gerſdorf, of Synbyholm; Otten Krag de Woldberg; Gundee Roſenkrantz de Winding; Frederick Ratz de Tygeſtrup; Peter de Reetz de Tygeſtrup; and Magnus Kaas de Stofring, all Daniſh ſenators, from Albert Wachters, in folio; Sophia Amelia, queen of Denmark and Norway, in large folio; Chriſtian, count de Rantzou, earl of Brandenbourg, a fine portrait, in large folio, both from the ſame painter; the frontiſpiece to the "Flora Danica" of Simonis Pauli, with a portrait of the author, after Carl van Mander, in quarto; and "The Four Seaſons," from the ſame painter, alſo in quarto.

Francis Pilſen was born at Ghent in the year 1676, and became the pupil of Robert van Audenaerd. There are very few prints by the hand of this artiſt, and the following are all we can ſpecify. "The Holy Virgin ſuckling the Infant Chriſt," after Rubens, in octavo; "The Converſion of St. Bavon," a grand compoſition, arched at the top, after Rubens, in large folio; "The Judgment of Midas," after the ſame painter; and "The Martyrdom of St. Blaize," from Gaſpar de Crayer, both in folio.

Abraham Rademacker was born at Amſterdam, A.D. 1675, and died at Haerlem in 1735. He became an excellent landſcape painter and engraver, without any inſtructions, having never ſtudied under any maſter.

Rademacker drew in Indian ink, and painted in diſtemper, many views in Holland, which he embelliſhed with figures and animals; he alſo etched a collection of views in the United Provinces, in a very maſterly ſtyle; it contains three hundred prints, and was publiſhed at Amſterdam in 1731, in two quarto volumes.

Francis Harrewin was born at Bruſſels in the year 1681. He was the diſciple of Romyn le Hooghe, and engraved a conſiderable number of plates from his own compoſitions, and thoſe of other maſters. Among his works is a ſet of the caſtles and villas, for le Roy's account of the Brabant family, which was publiſhed in 1699; and alſo the following portraits of Henry de Lorraine, duke of Guiſe; Margarite de Valois, both in octavo; Albert, archduke of Auſtria, a whole length figure at prayer with St. James; its companion Iſabella, infanta of Spain, alſo kneeling, while St. Margaret is preſenting her with a wreath of flowers, both very rare prints in large folio, and after Rubens. Two folio views of the houſe of ſir P. P. Rubens, at Antwerp, after Van Croes, may alſo be reckoned among the beſt productions of Harrewin.

Francis de Wilde was a native of Holland, born ſome time about the year 1680; according to Huber, but probably at a ſomewhat earlier period, ſince the etchings of his daughter were publiſhed in 1703. He reſided at Amſterdam, where he etched and publiſhed “The Angels appearing to Abraham;” “The Birth,” or “Triumph of Venus;” views, of a ſea-port, and the city of Chalons, a landſcape with reapers, and ſome few other ſubjects, both hiſtorical and landſcape, which are believed to be all from his own compoſitions. His etchings are performed in a pleaſing and ſpirited ſtyle, and the above were publiſhed early in the eighteenth century.

De Wilde alſo acquired ſome celebrity by his collection of antique gems, which were etched by his daughter Mary, on fifty quarto plates, and publiſhed at Amſterdam, in the year which is mentioned above.

John Admiral, or l'Admiral, was born at Leyden, A.D. 1680. Under whom he ſtudied is not known, but his ingenuity was very conſiderable, and he employed much of his time in engraving natural hiſtory and anatomy. The anatomical plates which he engraved for the work of the celebrated Ruyſch are held in great eſtimation, and his other moſt important work is engraved from his own cabinet of inſects, to collect and arrange which occupied thirty years of his life, excepting that portion of his time which was neceſſarily ſpent in his profeſſional purſuits as an engraver. This collection was engraved on twenty-four plates, and publiſhed by l'Admiral himſelf in 1746.

A. van der Laan was born at Utrecht in the year 1690. He travelled to France, and remained there ſome years, during which time he was chiefly employed by the Pariſian bookſellers.

The moſt conſiderable work we have by this artiſt, is a ſet of landſcapes, many of which are of the heroic and claſſical ſubjects which were painted and drawn in Germany and Italy, by Polydore. They are etched in a very delicate ſtyle, but on cloſer examination they appear to want preciſion.

This artiſt alſo engraved a good number of plates after Van der Meulen, among which are the frontiſpiece for Ryer's Alcoran, in quarto; the portraits of Lawrence Coſter of Haerlem, in folio; a burleſque hunt of dwarfs, in large folio; and two large folio plates of “The Whale Fiſhery.”

Peter Bout was a native of Bruſſels, and was born in the year 1690. He painted converſational ſubjects, and always introduced the figures in the landſcapes of Bodewyns. There are ſome ſlight etchings by the hand of this artiſt, from his own compoſitions; among which the following are the moſt important. A ſet of four landſcapes, two of which are winter ſcenes with ſkaiters, the third a poſt chaiſe ſtopping at the door of an inn, and the fourth is a marine ſubject, in folio.

A. F. Bargas was the countryman and contemporary of Bout. He executed ſome few etchings of landſcapes in a free and ſpirited ſtyle, both from his own compoſitions and thoſe of P. Bout; which he uſually marked with the letters A. F. combined in a cypher, and placed before his name. Among theſe are a ſet of ſix views of towns, villages, &c. embelliſhed with figures from his own deſigns; and a ſet of four after P. Bout, *viz.* “A Fiſh Market;” “The Bride conducted to Church;” “A Country Wedding;” and “A Village Fair,” all of folio dimenſions. This laſt ſet was publiſhed, both with and without the names of the artiſts.

John Wanderlaar, or Wandelaar, was born at Amſterdam in the year 1692. He ſtudied the principles of drawing and engraving under Folkema and William van Gauwen; and was ſo much intereſted in the general proſperity of the fine arts of his native country, that he became one of the moſt diſtinguiſhed and ſtrenuous advocates in Amſterdam for the erection of a public drawing academy in that city.

Wandelaar paid great attention to the ſtudy of anatomy, and was acquainted with the three greateſt anatomical profeſſors of the age, namely Ruyſch, Kant, and Albinus, for the great work of the latter of whom he engraved the large anatomical figures, ſo much and ſo juſtly admired. They were drawn from the ſubjects themſelves by Wandelaar under the inſpection of Albinus, who appears to have directed him, though, copying from dead and flayed ſubjects, to ſwell out the muſcles to the natural plumpneſs of living and ſtrong men. The plates are engraved in a clear ſtyle, well adapted to the occaſion, and were firſt publiſhed in the year 1747. The work appeared under the title of “Tabulæ ſceleti et muſculorum corporis humani,” and was ſoon tranſlated into Engliſh, and the plates copied by Grignion, Ravenet, Scotin, and others. Wandelaar likewiſe painted portraits on paſteboard; and drew with great ability in red and black chalks, frequently copying the pictures of the old maſters. The following engravings alſo are by him. A ſet of twelve quarto plates, of “The Birth, Life, and Death of Our Saviour;” the portrait of Herman Boerhaave, profeſſor of medicine at the Leyden academy, in folio; and two octavo plates of “The Grand Emir and his Wife; or King and Queen of the wandering Arabs.”

Jacob Folkema was born at Dockum, in Frieſland, in the year 1692, and eſtabliſhed himſelf at Amſterdam, where he died A.D. 1767. He ſtudied engraving under his father, and produced a great number of plates, of which ſome are after Picart, and others from his own compoſitions. They conſiſt chiefly in ſmall portraits, and vignettes for books. This artiſt had a ſiſter Anne, who painted miniatures with ſome ſucceſs; and likewiſe made ſome few etchings.

The moſt eſteemed of the engravings of Folkema are, an emblematical ſubject on the death of the prince of Orange, William IV.; “Time unveiling a Buſt of Francis Rabelais,” ſurrounded with allegorical figures, in quarto, an odd compoſition: A lion and dog ſleeping; and its companion, a lion and cat ſleeping, in folio. The portraits of Michael Cervantes de Saavedra, from G. Kort; John Ens, profeſſor of theology at Utrecht, after Colla; Petrus de Maſtricht, profeſſor of theology at Frankfort, from the ſame painter; Humphry Prideaux, dean of Norwich, after E. Seeman jun. all in quarto.; Snethlagius, an eccleſiaſtic of Amſterdam, from Anne Folkema, in folio; and “The Martyrdom of St. Peter and St. Paul,” in large folio, after Nicolo del Abbate, for the Dreſden collection.

Jacob de Wit was born at Amſterdam in the year 1695, and died in the ſame city in 1754. He was ſucceſſively the diſciple of Albert Spires, a portrait painter, and Jacob van Halen, an hiſtorical painter, but he greatly conduced to his own improvement, by ſtudying the pictures of Vandyke and Rubens. De Wit painted hiſtory, and excelled in painting in imitation of bronze and marble baſſo-relievo. In the year 1712, which muſt have been while he was yet a youth of ſeventeen, he made drawings from the ceilings in the Jeſuits' church at Antwerp, by Rubens, ſome of which he engraved, or aſſiſted Punt in engraving. He likewiſe etched a few other plates in a free intelligent ſtyle, among which are “The Holy Virgin and Infant Saviour,” in ſmall quarto; and a ſet of four of groups of cupids and genii, variouſly engaged, in large quarto; the latter ſet are probably his very beſt productions in this art.

John Punt was born at Amſterdam in the year 1711. He ſtudied engraving under Van der Laan, and the art of painting in imitation of baſſo relievo, under Jacob de Wit. He alſo painted hiſtory in a ſtyle which bears ſtrong reſemblance to that of Terveſtin, and after the age of fifty-five executed ſeveral ceilings; but we have here to treat of him only as an engraver.

In his folio prints from the compartments of the cielings of the Jeſuits' college at Antwerp, Punt diſcovers admirable taſte and ſkill. Perhaps in the works of no engraver whatever, may be ſeen better examples of the bold fore-ſhortening of Rubens, whoſe knowledge of the perſpective of objects, when ſeen from beneath, and eſpecially that of the human figure, is admirably diſplayed in theſe ceilings, and is not leſs admirably rendered in the engravings, through the medium however of drawings, which we have already mentioned, and which muſt in all probability have been excellent, by J. de Wit.

Punt is one of thoſe artiſts whoſe general reputation in the world has been by no means in proportion to their merits. Strutt, as the preſent writer conceives, could not have ſeen his productions, or could only have ſeen thoſe few plates which, though they bear his name, are evidently the work of ſome inferior artiſt, for he calls him, with a tone of acquieſcence in the deficiency of his fame, "a Dutch engraver of no great note;" and Huber and Martini have fallen into another error reſpecting him, (as will be noticed below,) which has alſo tended to deprive him of ſome portion of his juſt meed of reputation.

Regarding his "Moſes on the Summit of Piſgah;" his "Queen of Sheba in the Preſence of Solomon;" his "Nativity of Chriſt," or any other of the beſt of this ſeries of engravings from the ceiling of the Jeſuits' college, we ſcarcely know where to look for an hiſtorical engraver who accompliſhed more ſucceſsfully, what he evidently aimed at; or who has imparted to his works more of the appearance of finiſh with the reality of ſlightneſs. Other men may proceed in the production of more operoſe works by careful obſervation and patient induſtry; a well-practiſed hand, guided by the vivid and ſpontaneous feeling of a taſteful mind, is alone adequate to the production of ſuch prints as theſe. The art of leaving broad maſſes of white paper, without the leaſt appearance of baldneſs, crudeneſs, or chalkineſs, Punt poſſeſſed in an exemplary degree; and notwithſtanding his ſlightneſs, his tones, when required to be ſo, are ſweet, hazy, and aerial, in the *upper* parts, and it ſhould be remembered that, in theſe celebrated ceilings, the perſpective points, of ſight and diſtance, are not in the horizon but in the heavens, while, in the lower part, his engraving is rich, mellow, and vigorous. In "The Adoration of the Magi," and "St. Michael expelling the rebellious Angels," theſe qualities are more eſpecially obſervable. In the latter the rolling clouds, and ſmouldering ſmoke, and bickering flame, as well as the nudities, wings, ſhield, and drapery of the figures, are treated in a very ſuperior ſtyle. His metal vaſes, armour, and other ſuch objects, have alſo, though done with ſmall labour, a peculiarly poliſhed and glittering character, and all the various objects that enter into theſe ſeveral compoſitions are harmonized with artful ſimplicity, and in each are ſo thoroughly incorporated, that all evidently appears to be the production of the ſame hand and mind; and that mind, at no time languid; but always animated, rapid, in full poſſeſſion of itſelf, and carrying the ſpectator of taſte along with it.

The chiaroſcuro of Punt is broad, bold, and harmonious; his lights are bright; his ſhadows and reflexes cleared and enriched by vigorous touches of the graver, and his moſt delicate tints are firm. His ſtyle of manual execution, generally ſpeaking, conſiſts of maſterly courſes of lines firmly etched, or freely engraven: ſo freely, that the dextrous incorporation of theſe two modes of art are in his works much to be praiſed. Sometimes he throws a ſecond, and ſometimes a third courſe of engraved lines acroſs his etching with the utmoſt freedom, as may be ſeen in the draperies, clouds, ground, and other paſſages of his works; and upon other occaſions, as in metallic and other ſhining or poliſhed ſubſtances, he employs an interline, always adapting his hatching, ſo as to characterize, in proportion to their relative degrees of importance in the compoſition, the ſeveral textures of the ſurfaces to be expreſſed.

Huber and Martini ſtate that of the ſet of engravings from the compartments of the ceiling of the collegiate church of the Jeſuits, ten were etched by Jacob de Wit, namely, "The Fall of the rebel Angels;" "The Aſcenſion of Elias;" "Eſther before Ahaſuerus;" "The Nativity;" "The Triumph of St. Joſeph;" "The Temptation," "Reſurrection," and "Aſcenſion of Chriſt," and "The Aſſumption" and "Coronation of the Holy Virgin."

Now, theſe ten engravings exhibit two ſuch diſtinct and almoſt oppoſite ſtyles of etching, that they cannot all be the production of the ſame artiſt. It is further obſervable, that the whole ſet of thirty-ſix bear the name of De Wit as the draughtſman who, in the firſt inſtance, made thoſe copies from the ceilings of Rubens, from which the plates were engraven,—one only of thoſe ten mentioned by Huber and Martini bears the addition of "aquaforti" to the words "J. de Wit delineavit," and that one is "The Temptation of Chriſt in the Deſart," which is etched in a ſtyle very inferior to "The Fall of the rebel Angels," and thoſe other ſubjects which are enumerated above; another, which is inſcribed "De Wit aquaforti," is "Abraham offering up Iſaac," which is not mentioned by thoſe authors as being the production of his etching-needle. On the whole, we are therefore led to claim all the moſt meritorious of theſe engravings for John Punt, and to conclude that Huber and Martini muſt, in this inſtance at leaſt, have written at random.

The works of this artiſt, with which we are acquainted, are the portraits of Joanna Koerten Block, as a medallion with attendant genii, and Jacques de Roure of Antwerp, from a picture by himſelf, both in quarto. A ſet of forty ſmall folio plates, of which the ſubjects are taken from La Fontaine's fables, after the deſigns of d'Oudry, publiſhed in 1758 and 1759; a ſet of thirty-ſix folio plates from Rubens' ceilings of the collegiate church of the Jeſuits at Antwerp, prefaced by an hiſtorical portrait of this great painter, with allegorical accompaniments deſigned by De Wit. "The Aſcenſion of Our Saviour," engraved after Sebaſtian Rica, for the work which is entitled "The Dreſden Gallery;" "The Engliſh Coach," after G. van der Myn, both in large folio; "The Guard-Houſe of the Dutch Officers," after C. Trooſt; engraved for the cabinet of M. Braamcamp at Amſterdam, by Punt and Tanje, and, by the ſame engravers in conjunction, "The Declaration of Love," and "The Propoſal of Marriage," both after Trooſt, and of folio dimenſions.

John Louis Krafft was born at Bruſſels, A. D. 1710. In 1733, he publiſhed a book, intitled "Trèſor de Fables choiſies des plus excellens Mythologiſtes," containing one hundred and fifty of his engravings. And afterwards the portraits for the hiſtory of the houſe of Auſtria, which was publiſhed in three folio volumes at Bruſſels, in 1744. This artiſt likewiſe etched five ſubjects after Rubens, which are ſpecified in the catalogue of the works of that maſter, all of which are very rare; and alſo, "Job ſurrounded by his Friends and his Wife;" "Chriſt giving the Keys to St.

Peter;" "Chriſt with Nicodemus," (half figures,) all from Rubens; "Jupiter and Danae," from a drawing by Rubens, after Titian, all in 4to.; "Venus and Cupid," from a drawing by Rubens, after Giorgione; "St. Martin dividing his Cloak with the Beggar," after Vandyke, in large folio; "The Village Goatherd," and "Country Converſation," both in folio; and a ſtormy ſea view, in large folio, all from Teniers.

Krafft heightened ſome of the impreſſions from his engravings with white chalk, which, from the difficulty of preſerving ſuch works, are now become rare and valuable.

Cornelius Trooſt was born at Amſterdam in the year 1697, and died in the ſame city in 1750. He was the pupil of Arnold Boonen, and beſides engraving both in lines and mezzotinto, he painted portraits, fancy ſubjects, and hiſtory, and was ſurnamed the Watteau of Holland, from the ſparkling delicacy of his touch, and purity, and beauty of his colouring. The etchings of this maſter are much ſought after for their truth and brilliancy; he likewiſe ſcraped ſeveral ſubjects in mezzotinto, among which are, a buſt of an old man with a long beard, and a girl drawing, both in 4to; the portrait of Pietro Locatelli da Bergamo, and that of Vlaming, the poet, with two Dutch verſes beneath, both in large folio, and all from his own drawings and paintings.

Philip Endlick, or Endelick, was born at Amſterdam A.D. 1700. He was the diſciple of Bernard Picart, and always reſided in the place of his nativity. The following portraits are engraven by him, from his own drawings, and are executed in a firm ſtyle. John Taylor, the celebrated oculiſt, of London; Henry, count of Moens; John Philip d'Almérie, governor of the iſle of St. Martin; John Goſewyn Eberhard Alſtien, John Noordbeck, Peter Hollebeck, and Leonard Beels, all clergymen of Amſterdam, of folio ſize.

Peter Tanjé was a native of Amſterdam. He was born in the year 1700, and died in the ſame city in 1760. Tanjé was a laborious artiſt, and engraved a great number of portraits, vignettes, &c. But his moſt conſiderable work is five plates, from the famous windows of St. John's church at Gouda, and he likewiſe worked for the Dreſden gallery. The following are ſelected from his engravings, as being moſt worthy the attention of the connoiſſeur.

Portraits.—Peter Tanjé, from J. M. Quickhard; John Maria Quickhard, both in folio; Martin Luther, from Lucas Cranach, in 4to.; Benjamin de Briſſac, an eccleſiaſtic of Amſterdam, from L. F. du Bourg; Charles Linnæus, profeſſor of botany at Upſal; John Oſterdyck Scheht, doctor of medicine at the Utrecht academy, after Quickhard; Albert Vogct, theologian; John Beukelman de Honn, an eccleſiaſtic, from P. M. Braſſer; John van Marle, an eccleſiaſtic of Rotterdam, after Curland; Thomas Philip de Boſſu, cardinal and archbiſhop of Mechlin, from Snyers, all in folio; Lawrence Heiſter, ſurgeon; and Henry Ulhonn, phyſician; two medallions on the ſame plate, from Quickhard in 4to.; William van Haren, regent of Frieſland, from Akema, in an oval; William, prince of Orange, from F. de la Croix; George II. of England, from Faber; Charles VII. of Germany; Chriſtina, queen of Sweden, from Seb. Bourdon; Guſtavus Reinbeck, doctor of theology, from Peſne; and M. Fagel, after G. J. Xavery, all in folio.

For the Gallery of Dreſden.—A man with a book, from Correggio, known by the name of "The Phyſician of Correggio," in large folio; a woman in a bonnet, after Rubens, in folio; "A dead Chriſt," from F. Salviati; "Children dancing before the Altar of Love," from Albano, both in large folio; "Card Players," after Michael Angelo; "Tarquin and Lucretia," from Lucas Jordaens, both in folio; "Joſeph and the Wife of Potiphar," half figures, from Carlo Cignani; and a portrait of a man, after Rembrandt, half length, both of folio ſize.

Hiſtorical, &c.—"The Temptation of Job," after Trooſt, in 4to.; "The Court of Law, of the Peaſants of Puiterveen," for the cabinet of M. Ploos van Amſtel; and its companion, "The wicked Tavern-keeper at Puiterveen;" "Falſe Virtue or ſham Sorrow;" and its companion, "The Tutor deceived," all in folio; "The Philoſophers, or the runaway Girl;" "The ſick Chamber of the Dutch;" and "The Marriage of Chlorus and Roſetta," all in large folio, after Trooſt.

Peter van Bleeck the younger was born in the year 1703, ſomewhere in Flanders, but for the greater part of his life reſided in England, and died in London A.D. 1764. He was a mezzotinto ſcraper, and the ſon of Richard van Bleeck, a portrait painter; he always added the word junior to his name or cypher, for which ſee *Plate* IV. of thoſe uſed by the artiſts of the Netherlands.

Moſt of his works are portraits, and are executed in a ſtyle not inferior to that of John Smith. The following are ſome of the moſt important. Richard van Bleeck, from a picture by himſelf; Franceſco du Queſnoy, from A. Vandyke; Paul Rembrandt van Ryn, from a picture by himſelf; Eleanor Gwin, from ſir Peter Lely; Mrs. Cibber in the character of Cordelia; Mrs. Clive, in the character of Phillida; the comedians, Griffin and Johnſon, in the characters of Tribulation and Ananias, all from his own drawings; and "The Virgin with the Infant Saviour," after Vander Werff. The four laſt are in large folio, the reſt ſomewhat ſmaller.

Arthus Schouman was born at Dordrecht in the year 1710, and ſtudied the principles of art under Adrian vander Burg. He became a painter of ſome repute, and in 1748, he eſtabliſhed himſelf at the Hague, where he continued to exerciſe his various talents in crayon and water colour, painting; etching; mezzotinto ſcraping; and engraving on cryſtal, till toward the cloſe of the century.

Among his beſt prints are a ſmall etching of St. Francis; a man's head with muſtachios, in 4to; and a lady at her toilette, in 4to.; Saartze Jans, after Trooſt, with ſix Dutch verſes; a mezzotinto engraving in folio, and a party of amateurs at the houſe of a painter, alſo after Trooſt, and of 4to. ſize.

Simon Fokke was born A.D. 1712 at Amſterdam, and ſtudied engraving under John Caſpar Philips. He was a man of patient induſtry and unremitting application, but of little taſte, and no genius. The greater part of his works conſiſts of ſmall portraits and vignettes, which he executed for the Dutch bookſellers with conſiderable neatneſs. In the large hiſtorical works which he attempted he was far leſs ſucceſsful.

Among his beſt productions are the portraits for a work, intitled "Portraits hiſtoriques des Hommes illuſtres du Dannemarc;" it was publiſhed in 1746, in 4to.: and alſo the prints for another work, intitled "Arrivement et Sejour de L. A. S. S. et R. Monſeigneur le Prince Stadholder Héréditaire des Pays Bas, et de Madame ſon éſpouſe, á Amſterdam le 30 de Mai et jours ſuivans, en 1768." Of his ſingle prints upon a larger ſcale, the following are to be preferred. A portrait of himſelf, in 4to.; a view of the Y before Amſterdam, in folio; "The Statue of the Prince of Naſſau Weibourg," from Haag; "Jacob keeping the Sheep of Laban," from the Dreſden gallery, after Eſpagnoletto;

"Women bathing," after Trooſt ; a burleſque on the death of Dido, in the Dutch ſtyle, after the ſame painter ; a landſcape, with the effect of winter, after P. Breughel ; a view of the port of Livourna, after Vernet ; and its companion, a view in the neighbourhood of Narni in Lombardi, from the ſame painter, all in folio.

Jurian Cootwick, or Kootwyck, was originally a goldſmith, and born at Amſterdam in the year 1714. He excelled in drawing with Indian ink and crayons, and engraved after many of the old maſters, with ſome ability. An old woman ſeated, with a paper in her hand, in imitation of a drawing in black and white chalks ; another of the ſame ſubject, a man ſeated, with his hat on his knees ; a ſhepherd playing the flute, accompanied by a ſhepherdeſs ; a landſcape ; the ſame landſcape with alterations ; a pair of landſcapes ; a pair of ruſtic ſubjects, with cows ; and a loaded aſs, are all believed to be after his own drawings.

He alſo engraved a ſea view, after Lud. Backhuyſen, which is very rare ; a very highly finiſhed engraving of the ſame ſubject ; a paſtoral ſubject, with a ſhepherd and his flock, after Berghem ; and a ſet of three of cows and an aſs, after P. van Bloemen.

Jacob vander Schley was likewiſe a native of Amſterdam, and born in the year 1715. He was one of the beſt of the pupils of Bernard Picart, under whom he ſtudied till the death of that artiſt, and afterward finiſhed moſt of the plates which were left imperfect by him.

The greateſt part of the engravings of Schley are vignettes, portraits, and other book ornaments, which he executed in the ſtyle of his maſter : the following are ſome of the beſt of them.

"An Emblem of Divine Juſtice;" John Baptiſta Boyer, marquis d'Argens, from Th. van Pee ; Antonio Bernard Prévot, almoner to the prince of Conti, both in 4to. ; Bernard Picart, ſurrounded with allegorical figures, deſigned by Schley himſelf in folio ; Henry de la Tour, viſcount Turenne ; and "The Combat between Jarnac and Chataigneraye," both ſmall plates, and from drawings by the engraver himſelf.

Peter Spruyt was born at Antwerp in the year 1720. He was a man of ſome talent, and etched ſeveral plates, amongſt which are the following, all after Rubens.

"Suſannah ſurpriſed by the Elders ;" "The Rape of Orythia ;" "The Continence of Scipio ;" and a group of children with wreaths of flowers, all of folio ſize.

C. Exſhau was a native of Holland, whom Brandes miſtakenly ſuppoſes to have been an Engliſhman. He was born in the year 1730, and became one of the moſt ſucceſsful of the numerous imitators of Rembrandt, after whoſe pictures and prints he chiefly engraved.

Among his beſt works are, the head of an old man with a beard and large round hat, executed by means of mezzotinto combined with etching ; head of an old man with a beard and ſhort hair, both ſmall ; "Joſeph accuſed by the Wife of Potiphar," a large folio print, with a ſtriking chiaroſcuro ; "The Storm and Ship," wherein are the apoſtles, alſo diſtinguiſhed by its very grand effect, all after Rembrandt ; a girl with a baſket of cherries, accompanied by two boys, is after Rubens.

Chriſtina Chalon was born at Amſterdam in the year 1749. She was diſtinguiſhed, from a very early period of life, by her talents and love for the fine arts, and was inſtructed in that of engraving by Van Amſtel, and Sarah Trooſt. The final period of her life has not been recorded, and ſhe may perhaps be ſtill living.

Chriſtina is believed to be of the ſame family with the two diſtinguiſhed painters of the ſame name, who are now practiſing their art with ſo much credit to themſelves, and benefit to the public, in this metropolis. There are prints from her hand which were produced at the very early age of ten years ; in particular one, containing three figures, a promiſing and honeſt earneſt of her future attainments. She engraved both in lines and in imitation of crayons. In the latter mode of art, her print of a ſcullion in converſation with two children, is ſtippled with ſufficient neatneſs. Among her beſt works in lines are two pair of heads in ſmall circles ; "The Entrance to School ;" "The Interior of a Village School," and ſome other plates, of which the ſubjects are various incidents of domeſtic converſation, and Dutch ruſticity.

We are now arrived at the time which gave birth to an engraver of the Low Countries, who is ſtill living, following his profeſſional purſuits in England, and known to the preſent writer. Ever regardful of the public, he ſtops ſhort with a diſtruſt of his own feelings, which may not be thought unbecoming, at the name of Mr. Anthony Cardon.

Low *Flank* and *Hemiſphere*. See the ſubſtantives.

Low *Iſland*, in *Geography*, a ſmall iſland in the Eaſt Indian ſea, near the S. coaſt of Cumbava. S. lat. 9° 1'. E. long. 117° 34'.

Low *Green Point*, a cape on the E. coaſt of the iſland of Sumatra. S. lat. 7° 12'. E. long. 106°.

Low, in the *Manege*—*To carry Low*. See CARRYING.

Low *Maſs*. See MASS.

Low *Style*. See STYLE.

Low *Water*. See WATER.

Low *Wines*. See *Low* WINES.

LOWCOOTY, in *Geography*, a town of Hindooſtan, in Bahar ; eight miles W. of Mongir.

LOWDEBA, a town of Hindooſtan, in Allahabad ; 24 miles S.S.W. of Allahabad.

LOWE, PETER, in *Biography*, a ſurgeon of the ſixteenth century, was born in Scotland. In a work, entitled "A Diſcourſe on the whole Art of Chirurgery," publiſhed at Glaſgow in 1612, he acquaints his readers, that he had practiſed twenty-two years in France and Flanders ; that he had been two years ſurgeon-major to the Spaniſh regiment at Paris ; and had then followed his maſter, the king of France (Henry IV.) ſix years in his wars. In the title page of his book, he calls himſelf doctor in the faculty of ſurgery at Paris, and ordinary ſurgeon to the king of France and Navarre. It does not appear how long he had reſided at Glaſgow ; but he mentions that, fourteen years before the publication of his book, he had complained of the ignorant perſons who intruded into the practice of ſurgery, and that in conſequence the king (of Scotland) granted him a privilege, under his privy ſeal, of examining all practitioners in ſurgery in the weſtern parts of Scotland. He refers to a former work of his own, entitled "The Poor Man's Guide," and ſpeaks of an intended publication concerning the diſeaſes of women. His epitaph in the cathedral church-yard of Glaſgow (ſee Pennant's Tour to the Hebrides, p. 134.) is, however, dated 1612, in December of which year the work juſt mentioned was publiſhed ; ſo that he was probably prevented by death from fulfilling his intention. The "Diſcourſe on Chirurgery" appears to have been in eſteem ; for the fourth edition of it was printed in London in 1654. It is, indeed, copious, plain, and methodical ; full of references to ancient and modern authors ; and, in fact, like the majority of books of thoſe times, is more founded on authority than obſervation. Ames mentions another work of his with the following title, "An eaſy, certain, and perfect Method to cure and prevent the Spaniſh ſickneſs ; by Peter Lowe, doctor in the Faculty of Chirurgerie at Paris, Chirurgeon to Henry IV." London 1596, 4to. Aikin's Biog. Mem. of Med.

LÖWEN, in *Geography*, a royal town of Sileſia, in the county of Glatz, the inhabitants of which are chiefly employed in turning; 13 miles W. of Glatz. N. lat. 50° 13′. E. long. 16° 3′.

Löwen, *Löhen*, or *Lewin*, a town of Sileſia, in the principality of Brieg, on the Neiſſe; nine miles S.E. of Brieg. N. lat. 50° 40′. E. long. 17° 33′.

LÖWENBERG, or Lemberg, a town of Sileſia, in the principality of Jauer, near the Bober; 25 miles W. of Jauer. N. lat. 51° 5′. E. long. 15° 42′.

LOWENDAHL, Ulric-Frederic, Woldemar, *Count of*, in *Biography*, a celebrated general, was born at Hamburgh in the year 1700. His father, grand marſhal and miniſter of the king of Poland, elector of Saxony, inured him to arms when he was only thirteen years old. He roſe gradually in the army, and ſerved in ſeveral campaigns, expoſed to the dangers and fatigues of warfare, proving himſelf, on all occaſions, worthy of the rank he held, by his valour and prudence. In 1721 the king of Poland gave him the command of his horſe-guards and a regiment of infantry; his leiſure time he employed in the profound ſtudy of gunnery and fortification, and in 1728 he was made field-marſhal and inſpector-general of the Saxon infantry. After the death of the king he diſtinguiſhed himſelf in the defence of Cracow; in the following campaigns he commanded the Saxon auxiliaries on the Rhine under prince Eugene, and he had a chief command at the ſtorming of Otchakof. In 1743 he entered the ſervice of the king of France, and was for ſome years actively employed in the war in which that monarch was engaged. In 1747 he attained the ſummit of his glory as a beſieging general, by making a ſweep of ſeveral towns of Flanders, concluding with that of Bergen-op-Zoom, which had been deemed impregnable. Immediately after the capture of this laſt place Lowendahl was declared a marſhal of France. He now retired from the active ſcenes of war, and diſtinguiſhed himſelf as a worthy eſtimable character in private life, equally agreeable and inſtructive in converſation, and furniſhed with a variety of knowledge. He was converſant with many languages, and devoted a large portion of his time to reading. He died at the age of fifty-five. His name had been ſome time enrolled among the honorary members of the Academy of Sciences. Moreri.

LOWENDOLLAR, or Lyondollar, a Dutch ſilver coin, valued at 42 ſtivers, or a little more. This coin is ⅔ of the ducatoon, weighs 17 dwts. 14 grs., and is valued at 43.07*d*. in ſir I. Newton's Table of Aſſays, &c.

LÖWENSTEIN, in *Geography*, a town and capital of a county, which is a ſief annexed to Wurtemberg; nine miles E.S.E. of Heilbron. N. lat. 49° 6′. E. long. 9° 28′.

LOWER, Richard, in *Biography*, an eminent phyſician and anatomiſt, was born at Tremere, in Cornwall, about the year 1631. He was deſcended from a good family, and received a liberal education, being admitted as king's ſcholar at Weſtminſter ſchool, and thence elected to Chriſt-church college, in Oxford, in 1649. After the uſual courſe of univerſity ſtudies, he took the degree of M.A. in 1655, and then turned his attention to medicine. He became acquainted with the celebrated Dr. Willis, who employed him as a coadjutor in his diſſections, and found him ſo able an aſſiſtant, that he afterwards became his ſteady friend and patron, and introduced him into practice. In 1665, Lower took the degree of M.D.; and in the ſame year publiſhed a defence of Dr. Willis's work on fevers, entitled "Diatribæ Thomæ Williſii M.D. et Prof. Oxon. de Febribus Vindicatio adverſus Edm. de Meara Ormondienſem Hibern. M.D." 8vo., a work of conſiderable learning and force of argument, but not without ſome fallacies, as he afterwards himſelf admitted. But his moſt important work was, his "Tractatus de Corde, item de motu et calore Sanguinis, et Chyli in eum tranſitu," which was firſt printed in London in 1669. In this work the ſtructure of the heart, the origin and courſe of its fibres, and the nature of its action, were pointed out with much accuracy and ingenuity. He likewiſe demonſtrated the dependance of its motions upon the nervous influence, referred the red colour of the arterial blood to the action of the air upon it in the lungs, and calculated the force of the circulation, and the quantity and velocity of the blood paſſing through it. In a word, this treatiſe was one of the moſt important contributions of the time to anatomical and phyſiological improvement. The work excited particular notice, in conſequence of the chapter on the transfuſion of blood from the veſſels of one living animal to thoſe of another, which the author had firſt performed experimentally at Oxford, in February 1665, of which ſome account had been laid before the Royal Society, and printed in the Philoſ. Tranſactions 1666, through the requeſt of the Hon. Robert Boyle. He ſubſequently practiſed the transfuſion upon an inſane perſon before the Royal Society. Lower claims the merit of originality in this matter; but the experiment had certainly been ſuggeſted long before by *Libavius* (which ſee), and it is a matter of diſpute with whom the thought firſt originated. It is allowed, however, that the French firſt tried the experiment upon the human ſubject. But it were uſeleſs to enter into the queſtion; ſince experience ſoon decided, that the operation was attended with pernicious conſequences, and it was therefore exploded. Lower had removed to London ſoon after the commencement of theſe experiments, and in 1667 had been a fellow of the Royal Society, and of the College of Phyſicians. The reputation acquired by his publications brought him into extenſive practice; and after the death of Dr. Willis, he was conſidered as one of the ableſt phyſicians in London. But his attachment to the Whig party, at the time of the Popiſh plot, brought him into diſcredit at court, ſo that his practice declined conſiderably before his death, which occurred in January 1690-91. He was buried at St. Tudy, near his native place, in Cornwall, where he had purchaſed an eſtate. In addition to the writings above-mentioned, he communicated ſome papers containing accounts of anatomical experiments to the Royal Society; a ſmall tract on catarrh, which was added, as a new chapter, to the edition of the treatiſe de Corde of 1680; and a Letter on the ſtate of medicine in England. Gen. Biog. Eloy Dict. Hiſt. de la Med.

Lower, *To*, in *Sea Language*, is to eaſe down gradually, expreſſed of ſome weighty body, which is ſuſpended by tackles or other ropes, which being ſlackened, ſuffer the body to deſcend as ſlowly or expeditiouſly as the occaſion requires. Hence lower *handſomely*, and lower *cheerly*, are oppoſed to one another; the former being the order to lower gradually, and the latter to lower expeditiouſly.

Lower *Alloway's Creek*, in *Geography*, a townſhip of America, in Salem county, New Jerſey.

Lower *Creek*, a river of America, in the weſtern territory, which runs into the Ohio. N. lat. 40° 9′. W. long. 80° 43′.

Lower *Dublin*, a townſhip of America, in Philadelphia county, Pennſylvania, containing 1495 inhabitants.

Lower *Landing*, or *Eaſt Landing*, lies on Niagara river, Upper Canada, oppoſite to Queenſtown on the Niagara-fort ſide.

Lower *Marlborough*, a poſt-town of America, in Maryland, 30 miles from Annapolis, and 12 from Calvert court-houſe.

Lower *Milford*, a townſhip of America, in Burk's county, Pennſylvania.

Lower *Penn's Neck*, a townſhip of America, in Salem county, New Jerſey.

Lower *Weau Towns*, lie in the territory N.W. of the Ohio, 20 miles below Rippacanoe creek, at its mouth in Wabaſh river.

Lower, in *Rural Economy*, a term provincially applied to a lever in ſome places.

LOWERING, in the *Diſtillery*, a term uſed to expreſs the debaſing of the ſtrength of any ſpirituous liquor by mixing water with it. The ſtandard and marketable price of theſe liquors are fixed, in regard to a certain ſtrength in them called *proof*; this is that ſtrength, which makes them, when ſhook in a phial, or poured from on high into a glaſs, retain a froth or crown of bubbles for ſome time. In this ſtate ſpirits conſiſt of about half pure or totally inflammable ſpirit, and half water; and if any foreign or home ſpirit is to be expoſed to ſale, and is found to have that proof wanting, ſcarce any one will buy it, till it has been diſtilled again and brought to that ſtrength; and if it is above that ſtrength, the proprietor uſually adds water to it to bring it down to that ſtandard. This addition of water, to debaſe the ſtrength, is what is called lowering it. People well acquainted with the goods will indeed buy ſpirits at any ſtrength, only lowering a ſample to the proof ſtrength, and by that judging of the ſtrength of the whole; but the generality of buyers will not enter into this, but have it all lowered for them.

There is another kind of lowering in practice among the retailers of ſpirituous liquors to the vulgar: this is the reducing it under the ſtandard of proof. They buy it proof, and afterwards increaſe their profit upon it, by lowering it with water one-eighth part. The quantity of ſpirit is what they generally allow themſelves for the addition of water; and whoever has the art of doing this, without deſtroying the bubble proof, as this is eaſily done by means of ſome addition that gives a greater tenacity to the parts of the ſpirit, will deceive all that judge by this proof alone; that is, very nearly all who are concerned in the ſpirit trade. Such an additional quantity of water as one-eighth makes the ſpirit taſte ſofter and cooler, and will make many prefer it to the ſtronger ſpirit, which is hotter and more fiery; but unleſs the ſpirit, thus lowered, were tolerably clean, or the proof be ſome other way preſerved, the addition of the water lets looſe ſome of the coarſe oil, which makes the liquor milky, and leaves a very nauſeous taſte in the mouth. Shaw's Eſſay on Diſtillery.

The way to judge of ſpirits not being thus lowered or debaſed in ſtrength, is to examine them by the eye and tongue; and in buying a quantity of proof goods, ſuch ſhould always be choſen as are clean, thin, and light, and have a good crown of froth, which goes off in large bubbles, ſuch as taſte ſoft and uniform, and are not high flavoured, of an alkaline guſt, nor acrid and fiery, but ſoon quit the tongue.

Lowering *the Flag*. See Flag.

LOWES Water, in *Geography*, a lake of England, in the county of Cumberland, about ſix miles in circumference; 10 miles S. of Cockermouth.

LOWEST Region. See Region.

LOWESTOFF, in *Geography*, a market-town and pariſh in the hundred of Mutford and Lothingland, on the coaſt of Suffolk, England. For a conſiderable period it was denominated Lothnwiſtoft, as ſome think, from Lothbroch, a noble Dane, who landed in this neighbourhood about the year 864, and *wiſta*, a half hide of land. This derivation of its name is extremely doubtful. The town, however, is certainly of much earlier origin. Mr. Gillingwater, in his "Hiſtory of Loweſtoft," ſays it can be traced back to a period anterior to the fourth century. This town has ſuffered much from the plague at different periods, particularly in the years 1348 and 1547. It has likewiſe ſuſtained frequent plundering and depredations, on account of the attachment of its inhabitants to the cauſe of royalty.

The ſituation of this town is lofty, and exhibits a fine and commanding appearance. It extends about a mile in length, and conſiſts chiefly of one principal ſtreet, running in a gradual deſcent from north to ſouth, which is interſected by ſeveral ſmaller ſtreets or lanes from the weſt. The whole is, in general, well paved, and many of the houſes, having been lately rebuilt in the modern ſtyle, give the town an appearance of great neatneſs. From its ſituation and expoſure to the northern ocean, over which it commands an extenſive proſpect, it enjoys a moſt ſalubrious air, keen, but bracing. On the declivity of the cliff a number of hanging gardens are formed, which are interſperſed with alcoves and ſummer-houſes. At the foot of theſe gardens is a long arrangement of fiſhing-houſes, extending the whole length of the town. Between theſe and the beach ſtand the boats employed in the herring-fiſhery, which is the chief ſupport of the town, 70,000 barrels being exported from hence every ſeaſon. Here are alſo two light-houſes, conveniencies for boat-building, and accommodations for bathing. A conſiderable number of families reſort here for the benefit of the ſalt-water. Beſides theſe ſources of wealth to the inhabitants, there is a tolerable mackarel fiſhery, which commences in May and continues till the latter end of June, and ſupplies the adjacent markets, as well as the metropolis. A ſmall china manufactory, and a ropery, alſo belong to the town.

The church, ſituated about half a mile weſt from the town, is a very fine building, in the pointed ſtyle of architecture, and conſiſts of a nave with two ſide aiſles. The principal entrance is by a ſtately porch, on the ſouth ſide of which are three niches, the centre one intended for the reception of a ſtatue of St. Margaret, the ſaint to whom the church is dedicated. The chancel is particularly neat and elegant. The font, which is very ancient, is aſcended by three ſtone ſteps, the upper one bearing an inſcription, but ſo much corroded as to be almoſt unintelligible. It is ſurrounded by three rows of ſaints, each row containing twelve figures, and is otherwiſe finely adorned by carved work. Mr. Whiſton, the friend of ſir Iſaac Newton, and ſome time profeſſor of mathematics in the univerſity of Cambridge, from which he was expelled for his Arian principles, was long vicar of this church. This town had likewiſe formerly three chapels of eaſe, but only one of them now continues to be uſed. There are diſſenting meeting-houſes here for Methodiſts and Preſbyterians. A theatre was erected in 1790.

Loweſtoff is protected by ſtrong batteries on the ſea-ſide. From its extenſive fiſhery, it is a good nurſery for ſeamen, and has given birth to ſeveral eminent naval officers. A great ſea-fight took place off this town on the 3d of June, 1665, between the Britiſh fleet under the duke of York, and the Dutch fleet, which was commanded by admirals Opdam and Van Tromp, in which the latter were defeated with the loſs of eighteen ſhips taken and fourteen ſunk. In this action, admiral ſir Thomas Allen, a native of this town, particularly diſtinguiſhed himſelf. In the vicinity of Loweſtoff formerly ſtood the village of Newton, which has been entirely ſwallowed up by the ſea.

Loweſtoff, according to the parliamentary returns of 1800, contained 572 houſes, and 2332 inhabitants. The market is held on Wedneſday, and the fairs on the 12th of May and 19th of October. A very full hiſtory of this town has been publiſhed under the following title, "An hiſtorical Account of the ancient Town of Loweſtoff, with curſory Remarks on the adjoining Pariſhes, and a general Account of the Iſland, by Edm. Gillingwater, 4to. 1790."

LOWHILL, a townſhip of America, in Northampton county, Pennſylvania, containing 545 inhabitants.

LOWITZ, George Moritz, in *Biography*, profeſſor at Gottingen, and member of the Imperial Academy of Sciences at Peterſburgh, was born, in 1722, at Fürth, near Nuremberg. He was put apprentice to the trade of a goldſmith, and by his expertneſs in the buſineſs, he was enabled afterwards to conſtruct and improve mathematical inſtruments, with the uſe of which he was well acquainted. He now turned his attention to ſcience, and made a very uncommon progreſs in mathematics and natural philoſophy. In 1748, he diſtinguiſhed himſelf by conſtructing two charts of the ſolar eclipſe, which was to take place in the following July. He afterwards obſerved the eclipſe with great accuracy, by a new method of his own invention. Next year he publiſhed a chart repreſenting the ſolar eclipſe announced for the 8th of January, 1750, as it would appear to the inhabitants of Peterſburg, Rome, Berlin, Nuremberg, Liſbon, &c. During theſe years he had been employed in the education of young perſons, and in 1751 he was appointed profeſſor of mathematics and natural philoſophy in the Egidian ſeminary at Nuremberg, and was entruſted with the care of the obſervatory. On his entrance into this new office he pronounced an oration on the advantages which might be derived from the ſtudy of the higher branches of mathematics, which was printed in 1752. He publiſhed in the ſame year an account of various experiments on the properties of the air, which he employed as a guide in his lectures. About this time he removed to Gottingen, and was made profeſſor of practical mathematics, with a ſalary of four hundred dollars. Having little to do as profeſſor, he filled up his vacant hours in writing papers on various uſeful ſubjects; the greater part of theſe were read before the Royal Society of Gottingen, and they added, in a conſiderable degree, to his reputation. He was at the ſame time employed by the Coſmological Society in conſtructing globes; but, after a time, conceiving his ſervices had not been ſufficiently remunerated, he quitted the ſociety with diſguſt. After this he was appointed, by the Hanoverian government, director of the obſervatory, an office which he reſigned in 1764, together with the profeſſorſhip; and he now reſided at Gottingen as a private individual. He ſoon found that his means were inſufficient for his ſupport: his affairs became embarraſſed, and his ſituation would probably have been forlorn, had not the Academy of Sciences at Peterſburg invited him into Ruſſia for the purpoſe of obſerving the tranſit of Venus, which was to take place in the year 1769. In a ſhort time after this he was appointed a member of the Academy of Sciences in the aſtronomical department, and he was ordered to repair to Surjef, a ſmall town on the river Ural, a few miles from the Caſpian ſea, the place deſtined for obſerving this curious phenomenon. This miſſion he accompliſhed in the completeſt manner, and publiſhed an account of it in the year 1770. He then proceeded, in the month of September, by the Caſpian ſea, to Aſtrachan, and having determined the geographical poſition of that city, he repaired to ſome other places for the like purpoſes. He was next engaged in ſurveys for a new canal, which he continued, at different periods, till the month of Auguſt, 1774, when the whole undertaking was unfortunately ſtopped by a ſudden and unexpected irruption of ſome rebel troops. Lowitz, and his friend and aſſiſtant, betook themſelves to places which they hoped would afford them ſhelter and ſecurity. The latter, after burying his books, inſtruments, and other property, ſought for ſafety in the fortreſs of Dmetrieſſk, from whence he proceeded to Aſtrachan. Lowitz, with his family, ſet out for the German colony of Dobrinka, but unfortunately fell into the hands of the rebel chief, who put him to death in the moſt barbarous manner. His wife and ſon were ſuffered to eſcape after they had been plundered of the beſt part of their property: but Lowitz's books, papers, and inſtruments, having been depoſited in an unoccupied houſe, were, by good fortune, preſerved. Gen. Biog.

LOWK, in *Agriculture*, a provincial term, ſignifying to weed corn, or other crops ſown broad-caſt.

LOWKOW, in *Geography*, a town of Poland, in the palatinate of Volhynia; 10 miles E. of Zytomiers.

LOWLANDS, a denomination applied to the ſouthern diſtricts of Scotland, in contradiſtinction to the *Highlands;* which ſee. The inhabitants of theſe different diſtricts differ from each other in language, manners, and dreſs; but the difference has been gradually decreaſing. The language, manners, habits, and dreſs of the gentlemen in the Low Countries reſemble thoſe of their Engliſh neighbours, with whom they have frequent intercourſe. The peaſantry and middle claſs are ſober, induſtrious, and good economiſts; hoſpitable and diſcreet, intelligent, brave, ſteady, humane, and benevolent. Their fidelity to one another is a ſtriking feature in their character. In their mode of living and dreſs there are ſome peculiarities, but theſe are gradually wearing out. Within theſe few years the uſe of pottage, and bread of oatmeal, is almoſt diſuſed among the commonalty, and tea, wheaten bread, and animal food, are as common on the north as on the ſouth of the Tweed. See Scotland.

LOWMAN, Moses, in *Biography*, was born in London in the year 1679. He was originally intended for the profeſſion of the law, was educated accordingly, and entered a ſtudent in the Middle Temple. When he attained to years of manhood, he abandoned the law, and determined to qualify himſelf for the office of miniſter among the Proteſtant diſſenters. With this view he proceeded to Holland, and purſued his ſtudies at Utrecht and Leyden, and on his return in 1710 he was choſen aſſiſtant preacher to a diſſenting congregation at Clapham, of which he was afterwards elected paſtor. In this connection he continued during the remainder of his life, diſcharging the duties of his ſtation with conſtancy and regularity, eſteemed and beloved by his flock, and highly reſpected by thoſe who knew him. As an author, his firſt publication was in 1740, and intitled "A Diſſertation on the Civil Government of the Hebrews, in which the true Deſign and Nature of their Government are explained, and the Juſtice, Wiſdom, and Goodneſs of the Moſaical Conſtitutions vindicated, &c." In 1745, he publiſhed "A Paraphraſe and Notes upon the Revelation of St. John," which is held in high eſtimation by the moſt judicious critics. The next work of Mr. Lowman was upon Jewiſh antiquities, intitled "A Rational of the Ritual of Hebrew Worſhip, &c." Beſides theſe, he printed a ſmall tract concerning "The Demonſtration of a God, from the Argument à priori," and a ſermon on Popery. He died in 1752, in the 73d year of his age. As he was a firm believer in the Chriſtian revelation, ſo he had imbibed the ſpirit which it recommends; and thoſe virtues and duties which he inculcated upon others he carefully practiſed himſelf. Biog. Brit.

LOWOSITZ, in *Geography*, a town of Bohemia, in the circle of Leitmeritz; four miles W.S.W. of Leitmeritz. N. lat. 50° 30'. E. long. 14° 9'.

LOWOWECH, or NEUSTAT, a town of the duchy of Warſaw; 33 miles W. of Poſen.

LOWREY, a town of Hindooſtan, in the circar of Gohud; 36 miles E.S.E. of Raat.

LOWTAIAH, a town of Algiers; 27 miles S. of Tubnah.

LOWTH, WILLIAM, in *Biography*, a learned Engliſh divine and commentator of the ſcriptures, ſon of an apothecary, was born in the pariſh of St. Martin's, Ludgate, in the city of London, in the year 1661: he was inſtructed in the claſſics at Merchant Taylors' ſchool, and made ſuch progreſs in them that he was deemed fully qualified for the univerſity before he was quite fourteen years of age, and was accordingly elected from thence into St. John's college, Oxford, in 1675. He took his degree of M.A. in 1683, and proceeded bachelor of divinity in 1688. His firſt publication was "A Vindication of the divine Authority and Inſpiration of the Old and New Teſtament," in anſwer to Le Clerc's famous five letters on this ſubject. This work attracted public notice, and he was appointed chaplain to Dr. Mew, biſhop of Wincheſter, and ſhortly promoted to a prebend in the cathedral church of that ſee, and to a rectory in Hampſhire. Mr. Lowth next publiſhed a ſmall piece, which has been very frequently reprinted, entitled "Directions for the profitable reading of the Holy Scriptures," &c. In 1714 he publiſhed two ſermons, and alſo "A Commentary on the Prophet Iſaiah," in quarto, which was followed, in 1718, by "A Commentary on the Prophet Jeremiah." In 1723 he gave the world his "Commentary on the Prophet Ezekiel," and ſoon after one on Daniel, and the minor prophets. Theſe illuſtrations of the prophecies were afterwards collected in a folio volume, as a continuation of biſhop Patrick's Commentary on the other parts of the Old Teſtament, in which form they have been frequently reprinted. Mr. Lowth, though an able ſcripture expoſitor, was a good general ſcholar, and furniſhed Dr. Potter, afterwards archbiſhop of Canterbury, with notes on Clemens Alexandrinus, which were publiſhed, with the author's name to each, in the doctor's edition of that father. He communicated to Dr. Hudſon remarks on Joſephus, of which that editor availed himſelf, and acknowledged his obligations in the preface to his edition of the Jewiſh hiſtorian. To the labours of Mr. Lowth many other learned men and valuable writers have been indebted, beſides thoſe above referred to. He died in 1732, being in the ſeventy-third year of his age. He was diſtinguiſhed for unaffected piety, a moſt exemplary zeal in the diſcharge of the paſtoral functions, and for an unremitting deſire of being uſeful to his pariſhioners. Biog. Brit.

LOWTH, ROBERT, ſon of the preceding, was born at Wincheſter in the year 1710. Here he was educated in grammar learning at the ſchool founded by William of Wykeham, in which he acquired an accurate knowledge of the Greek and Roman claſſics, and made conſiderable progreſs in oriental literature. Even at ſchool he diſcovered a poetical genius, and among other pieces which he wrote at that period, was a beautiful poem on "The Genealogy of Chriſt," as it is repreſented on the eaſt window of Wincheſter college chapel; and another, which appeared in the twenty-third volume of the Gentleman's Magazine, entitled "Catherine's Hill," the place where the Wincheſter ſcholars are allowed to play on holidays. In 1728, he was ſent to New college, Oxford, of which inſtitution he was elected a fellow in 1734: took his degree as M.A. in 1737, and was, in 1741, elected profeſſor of poetry in the univerſity of Oxford. In the diſcharge of the duties of this office he delivered his "Prælectiones" on Hebrew poetry, which will be noticed more at large hereafter. His firſt preferment in the church was the rectory of Ovingdon, in Hampſhire, to which he was preſented by biſhop Hoadly. In 1748, Mr. Lowth accompanied Mr. Legge, afterwards chancellor of the exchequer, to Berlin, who went to that court in a public character, and with whom, from his earlieſt years, he lived on terms of the moſt uninterrupted friendſhip. In the following year he undertook the charge of the ſons of the duke of Devonſhire, as travelling tutor on the continent. The duke was ſo thoroughly ſatisfied with the conduct of Mr. Lowth in this office, that he afterwards proved his ſteady friend and patron. In 1750 he was appointed archdeacon of Wincheſter, and three years after he was preſented to the rectory of Eaſt Woodhay, in the county of Southampton. In 1753 he publiſhed his work already mentioned, entitled "De ſacra Poeſi Hebræorum Prælectiones Academicæ;" of which he gave the public an enlarged edition in 1763, in two volumes 8vo. The ſecond volume conſiſts of additions made to the work by the celebrated Michaelis. This work, though entitled only "Lectures on Hebrew Poetry," will be found "An excellent compendium of all the beſt rules of taſte, and of all the principles of compoſition, illuſtrated by the boldeſt and moſt exalted ſpecimens of genius, which antiquity has tranſmitted to us, and which have ſeldom fallen under the inſpection of rational criticiſm. But theſe lectures teach us not only taſte, but virtue; not only to admire and revere the ſcriptures, but to profit by their precepts. The author has penetrated into the very ſanctuaries of Hebrew literature; he has inveſtigated, with a degree of preciſion which few critics have attained, the very nature and character of their compoſition; by accurately examining, and cautiouſly comparing every part of the ſacred writings; by a force of genius, which could enter into the very deſign of the authors; and by a comprehenſiveneſs of mind, which could embrace, at a ſingle view, a vaſt ſeries of correſponding paſſages, he has diſcovered the manner, the ſpirit, the idiom of the original, and has laid down ſuch axioms as cannot fail to facilitate our knowledge and underſtanding of the ſcriptures." Such is the opinion of this work given by the tranſlator of it, the late Dr. George Gregory. Subjoined to the "Prælectiones" is "A ſhort Confutation of Biſhop Hare's Syſtem of Hebrew Metre." In the year 1754, the univerſity of Oxford honoured the author with the degree of doctor of divinity, and in the following year he was nominated firſt chaplain to the marquis of Hartington, lord lieutenant of Ireland. Thither he accompanied that nobleman, and was, in a ſhort time, offered the biſhopric of Limerick, which however he exchanged for ſome preferment in the county of Durham, in his own country. In 1758, Dr. Lowth preached a ſermon at Durham, on Free Enquiry in Matters of Religion, which has been frequently reprinted. In the ſame year he publiſhed his "Life of Wykeham, Biſhop of Wincheſter," and founder of the colleges in which he had received his education. His next piece has been exceedingly popular in our ſchools, though now generally ſuperſeded by a work of the ſame kind by Mr. Lindley Murray, *viz.* "An Introduction to Engliſh Grammar." Paſſing over a controverſy between Dr. Lowth and Dr. Warburton, which did not reflect much credit on the angry tempers of the diſputants; we may obſerve that Dr. Lowth was elected a fellow of the Royal Society at Gottingen in the year 1765, and in the following year he was promoted to the ſee of St. David's, and almoſt immediately tranſlated to the biſhopric of Oxford. In this high office he remained till the year 1777, when he ſucceeded Dr. Terrick in the ſee of London. In 1778 he publiſhed the laſt of his literary labours, entitled "Iſaiah: A new Tranſlation, with a preliminary Diſſertation, and Notes, critical, philological, and explanatory." His deſign, in this work, was not only to give an exact and faithful repreſentation of the words and ſenſe of the prophet, by adhering cloſely to the letter of the text, and treading, as nearly as may be, in his footſteps; but, moreover, to imitate the air and manner of the author, to expreſs the form and faſhion of the compoſition, and to give the Engliſh reader ſome notion of the peculiar turn and caſt of the original. This verſion, excellent in itſelf, was not entirely faultleſs, and the miſtakes were pointed out by Michael Dodſon, eſq. (See Dodson.) In 1779 the biſhop was called on to preach a ſermon before the king at the Chapel-royal, on Aſh-Wedneſday, in which he attacked the opponents to the miniſterial ſyſtem of government, among whom was the celebrated Dr. Richard Price, who defended himſelf with energy and ſpirit. In 1781 biſhop Lowth was engaged in a law ſuit with Lewis Diſney Ffytche, eſq., concerning the legality of general bonds of reſignation, which, if Dr. Towers's ſtatement of the caſe be at all accurate, was highly diſcreditable to his lordſhip: ſuffice it to ſay, that in this caſe the deciſions of the courts of law, almoſt unanimouſly pronounced, were unexpectedly reverſed by the houſe of lords, by a ſmall majority of *one*, and of the numbers who voted on this occaſion fourteen were biſhops, and as ſuch parties in their own cauſe. (See Dr. Towers's Obſervations on the Cauſe between the Biſhop of London, and L. D. Ffytche, eſq.) In 1783 the biſhop was fixed on to ſucceed archbiſhop Cornwallis, but on account of his advanced age he thought proper to decline the high honour of the archbiſhopric of Canterbury. In the latter years of his life he endured a great degree of ſuffering from that dreadful diſorder, the ſtone, which he bore with fortitude and reſignation to the divine will. He experienced alſo ſome of the moſt painful ſtrokes of calamities which a father can experience, in the loſs of affectionate children. In 1768 his eldeſt daughter died at the age of thirteen, of whom he was paſſionately fond, and whoſe death he deplored in the following exquiſitely beautiful epitaph, which is inſcribed on her tomb:

Cara, vale, ingenio præſtans, pietate, pudore,
Et pluſquam natæ nomine cara, vale.
Cara Maria, vale. At veniet felicius ævum
Quando iterum tecum, ſim modo dignus, ero.
Cara, redi, læta tum dicam voce paternas,
Eja, age in amplexus, cara Maria, redi.

In 1783, his ſecond daughter, as ſhe was preſiding at the tea-table, ſuddenly expired. His eldeſt ſon alſo, of whom he was led to form the higheſt expectations, was hurried to the grave in the bloom of youth. His lordſhip died at Fulham in 1787, having nearly completed the 77th year of his age. Of biſhop Lowth's extenſive learning, fine taſte, and peculiar qualifications for the ſtation which he filled, he has left abundant proofs. While his amiable manners rendered him an ornament to the high rank in which he moved, and endeared him to all with whom he converſed, his zeal for the eſtabliſhed religion of the country made him anxious to promote to places of truſt and dignity ſuch clergymen as he knew were beſt qualified to fill them. He united, in an eminent degree, the qualities of the gentleman with thoſe of the ſcholar: he converſed with elegance, as he wrote with accuracy. His heart was tender and ſympathetic. He poſſeſſed a mind which felt its own ſtrength, and decided on whatever came before it with promptitude. In thoſe trials where affliction was to be ſuffered or ſubdued he behaved as a man and a Chriſtian. His piety had no tincture of moroſeneſs; his charity no leaven of oſtentation. The biſhop was author of ſome ſermons, preached on particular occaſions, and of many poetical pieces, ſome of which have been frequently reprinted; the titles of which will be found in the General Biography.

LOWVILLE, in *Geography*, a poſt-town of America, in Oneida county, New York; 550 miles from Waſhington.

LOWYA, a town of Hindooſtan, in Bahar; 15 miles S.S.E. of Bettiah. N. lat. 26° 35′. E. long. 84° 43′.

LOXA, or Loja, called by Abulfeda *Luſchah*, an irregularly built town of Spain, in the province of Grenada, ſituated partly on the declivity and partly at the foot of a hill near the Xenil, about five leagues W. of Grenada, and taken from the Moors in 1486. It contains three pariſhes, four convents, four hoſpitals, a bridge, and the ruins of a caſtle; together with a ſalt-work and a copper forge. It is the chief town of a corregidorad; the country about it is pleaſing, fertile, and full of olive trees, gardens, orchards, fine fruit trees, and flowers. In the vicinity are immenſe numbers of hares and rabbits. Near the town, towards Grenada, are a ſmall plain and a valley, both ſown with corn, flax, and hemp, and producing alſo a great quantity of vegetables. N. lat. 37° 18′. W. long. 4° 18′. It contains about 8000 inhabitants.

Loxa, or *Loja*, a town of South America, the capital of a juriſdiction of the ſame name, in the province of Quito, founded in the year 1546, by captain Alonſo de Mercadillo, and reſembling in extent, form, and buildings, the city of Cuença; but the temperature of the air is conſiderably hotter. Beſides two churches, Loja has ſeveral convents, a nunnery, a college of Jeſuits, and an hoſpital. In its diſtrict are 14 villages, and within the territory of its juriſdiction is produced the famous ſpecific for intermitting fevers, well known by the name of Caſcarilla de Loja, or Quinquina. (See Cascarilla and Cinchona.) The juriſdiction of Loja derives alſo great advantage from breeding the *Cochineal*; which ſee. The inhabitants of Loja, known over the whole province by the name of Lojanos, do not exceed 10,000 ſouls; though formerly, when the city was in its greateſt proſperity, they were much more numerous. Their character is much better than that of the inhabitants of Cuença; and beſides their affinity in cuſtoms and diſpoſition to thoſe of the other villages, they cannot be reproached with the character of being ſlothful. In this juriſdiction ſuch numerous droves of horned cattle and mules are bred, that it ſupplies the others of this province, and that of Piura in Valles. The carpets alſo manufactured here are of ſuch remarkable fineneſs, that they find a ready ſale wherever they are ſent. The corregidor of Loja is governor of Yaguarſongo, and principal alcalde of the mines of Zaruma; but the poſt of governor of Yaguarſongo is at preſent a mere title without any juriſdiction; part of the villages which formed it being loſt by the revolt of the Indians, and the others added to the government of Jaen; ſo that the corregidor of Loja enjoys only thoſe honours intended to preſerve the remembrance of that government. The town of Zaruma, in the juriſdiction of which are mines of gold, has preſented the corregidor of Loja with the title of its alcalde major. It was one of the firſt towns founded in this province, and at the ſame time one of the moſt opulent; but it is at preſent in a mean condition, owing chiefly to the decay of its mines, on which account moſt of the Spaniſh families have retired, ſome to Cuença, and others to Loja; ſo that at preſent its inhabitants are ſaid not to exceed 6000. The declenſion of theſe mines, which is owing to the negligence of thoſe that are concerned in working them, more than to a ſcarcity of the metal, has been diſadvantageous to the whole department of Loja; and conſequently diminiſhed the number of its inhabitants. S. lat. 4°. W. long. 79° 14′.

Loxa, a town of Sweden, in the province of Savolax; 108 miles N. of Nyſlot.

LOXARTHRUS, (from λοξος, *oblique*, and αρθρον, *a joint*,) in *Surgery*, deformity of a joint.

LOXIA, in *Natural Hiſtory*, a genus of birds of the order paſſeres, of which, according to Latham, there are eighty-five ſpecies; but in the laſt edition of Gmelin, there are an hundred ſpecies enumerated and deſcribed. This latter arrangement we ſhall follow in the preſent article. The eſſential character is as follows: the bill is ſtrong, thick, convex, rounded at the baſe; the lower mandible is bent in at the edge; the noſtrils are ſmall, and round at the baſe of the bill; the tongue is truncate. The familiar name of this genus is *groſbeak*.

In the loxia, emberiza, and fringilla genera, both mandibles are moveable, by which means they are able to ſhell and break in pieces the ſeeds they feed upon. Of this numerons tribe there are but five ſpecies that are Britiſh, which will be noticed by aſteriſks prefixed to the ſpecific names.

Species.

* Curviroſtra; Common croſs-bill. Mandibles croſſing each other; body varying in colour; wings and forked tail brown. Linn. *Le bec-croiſe*, Briſſ. *Sheld-apple*, or *croſs-bill*, Willoughby. This is the moſt remarkable bird of the whole genus. Both mandibles are hooked, and turned different ways, ſo that they do not meet in a point. The bill, however, is not uniformly in the ſame direction: in ſome individuals the under mandible is twiſted to the right, in others to the left ſide; a circumſtance that has been noticed, to prove that the variation in the bill is rather owing to certain uſes to which it is applied by the bird, than to any fixed appointment in nature. This ſpecies is found ſometimes in Britain, though it is not by any means a conſtant viſitor in theſe iſlands. It inhabits more generally the northern countries of Europe, eſpecially ſome parts of Germany, Switzerland, Ruſſia, Sweden, &c. where it is permanent the whole year. Birds of this ſpecies migrate, from unknown cauſes, into other countries, not regularly, but in the courſe of ſeveral years. They inhabit the pine foreſts, and feed upon the cones; for the ſcaling of which their bills are admirably formed. This bird is obſerved to hold the cone in one claw, like the parrot; and to have all the actions of that bird, when kept in a cage. It is ſaid to make its neſt in the very higheſt parts of the fir trees, faſtening it to the branch with the reſinous matter which exudes from the trees. Mr. Latham ſays, "I have never heard of its breeding in England, but know one inſtance of its being ſhot at large in the middle of ſummer. I have been told that they have done great damage in orchards, by tearing the apples to pieces for the ſake of the ſeeds, the only part they delight in. Many are taken with a bird-call and bird-lime, and others by a horſe-hair nooſe fixed to a long fiſhing-rod: for ſo intent are they on picking out the ſeeds of the cone, that they will ſuffer themſelves to be taken by the nooſe being put over the head.

There are two varieties: the one reddiſh, head ſcarlet; the other larger, bill thicker and ſhorter. The male is red, varied with brown and green, and is ſaid to change its colours thrice a year; the female is olive-green, mixed with brown.

Leucoptera; White-winged groſbeak. Mandibles croſſing each other; feathers whitiſh, edged with red; rump pale red; vent whitiſh; tail and wings black, the latter with two white bands. It inhabits North America; is about ſix inches long. The bill is of a horn colour; legs are brown. Latham received ſpecimens both from Hudſon's Bay and New York.

Psittacea; Parrot-billed groſbeak. Olive colour; quill and even tail-feathers edged with yellowiſh; lower mandible much ſhorter. The plumage in the female is not unlike that of the male, except the head, which is the ſame as the other parts of the body, with a mixture of yellowiſh-grey about the ſides of the head. It inhabits the Sandwich iſlands.

* Coccothrauſtes; Hawfinch. This is *le gros-bec* of Briſſon, and is rather larger than the foregoing ſpecies. It is of a cheſnut-aſh colour; wings with a white line, having the middle quill-feathers rhombic at the tips; tail-feathers black at the baſe of the thinner web. The female is leſs bright in colour; the part between the bill and the eye is grey, inſtead of black. This may ſerve as a general deſcription, but the colours vary very much. This ſpecies, though ranked among the Britiſh birds, viſits theſe kingdoms occaſionally, and for the moſt part in winter, and has never been known to breed here. It is more plentiful in France, where it may be ſeen in abundance about the beginning of April; and ſoon after makes its neſt between the fork of the branches of trees, about ten or twelve feet from the ground. It is compoſed of ſmall dry fibres, intermixed with liverwort, and lined with finer materials. The eggs are of a roundiſh ſhape, of a blueiſh-green, ſpotted with olive-brown, with a few irregular black markings interſperſed. It is alſo common in Italy, Germany, Sweden, and the weſtern parts of Ruſſia, where the wild fruits grow: in the reſt of the empire they are exceedingly ſcarce, except beyond lake Baikal, where they arrive from the ſouth in great plenty, to feed on the berries of a tree peculiar to that country. From the ſtrength of the bill, it cracks the ſtones of the fruit, of the haws, cherries, &c. with the greateſt eaſe.

* Ennucleator; Pine groſbeak. *Gros-bec de Canada*, Briſſon. *Le dur-bec*, Buffon. *Greateſt bullfinch*, Edwards. Wings with a double white line; tail-feathers all black; head, neck, breaſt, and rump, in the young bird red, in the old bird yellow; female olive, or greeniſh-brown, with here and there a reddiſh or yellowiſh tinge, but chiefly at the top of the head. It frequents the moſt northern parts of this kingdom, being only met with in Scotland, and eſpecially the Highlands, where it breeds, and inhabits the pine-foreſts, feeding on the ſeeds like the croſs-bill. It is found in all the pine-foreſts of Siberia, Lapland, and the northern parts of Ruſſia; common about St. Peterſburgh in the autumn, and is caught in great plenty at that time for the uſe of the table, returning north in the ſpring. Theſe birds are likewiſe common in the northern parts of America, and appear at Hudſon's Bay about the month of May, to which place they are ſaid to come from the ſouth, and are obſerved to feed on the buds of the willow.

Macroura; Long-tailed groſbeak. Black; band on the wings and back reddiſh-yellow; tail long, wedged. Inhabits

habits Africa, near the Senegal. It is about ſeven inches long; the bill and legs are black.

AUREA; Gold-backed groſbeak. Black; back golden; wing-coverts pale brown, ſpotted with black; legs blueiſh. It inhabits Benguelo.

RUBICILLA; Caucaſian groſbeak, ſo called from the Caucaſian mountains which it inhabits. It is about eight inches long. Scarlet, ſpotted with white; belly and vent roſy; greater wing-coverts brown; tail black; feathers of the body cinereous at the baſe, giving the plumage a waved appearance.

* PYRRHULA; Bullfinch. *Le Bouvreuil*, Briſſon. The bill of this bird is of a dark horn colour, the upper mandible hooked, and projects over the lower, which is roundiſh, like a parrot's; top of the head, feathers round the eye, and a ſpot under the beak, of a dark blue gloſſy black; the hind part of the neck and the back are grey; the throat and breaſt are of a beautiful fleſh-coloured red; belly and vent white, as is the rump; quill-feathers and tail black; wing-coverts blue-black, the leſs ones tipped with white; legs very ſhort and black. The female is black on the head, flight-feathers, and tail; breaſt and under parts of a reddiſh-brown; the rump whitiſh. There are three other varieties: 1. Entirely black. 2. White, back with a few black ſpots. 3. White; head, neck, breaſt, and belly roſy.

Theſe birds are very troubleſome viſitors to the orchards and gardens, in the ſpring of the year; feeding on the buds of cherries, plums, and other fruit-trees. They retire to woods and cloſe cover, to build their neſts in May. They have no ſong in the ſtate of nature, but are readily taught fine notes of muſic, and even to ſpeak. Females are made as perfect as males in muſical tunes. They form a ſlight neſt of twigs laid croſſways, and lay four eggs.

CARDINALIS; Cardinal groſbeak; Virginian nightingale. *Le gros-bec de Virginie*, Briſſon. Creſted, red; frontlet black; bill and legs blood-red; bill and legs pale roſy; creſt, when erect, pointed. The female differs from the male, being moſtly of a reddiſh-brown. This ſpecies is met with in ſeveral parts of North America, and has obtained the name of nightingale, on account of its fine ſong. In the ſpring, and moſt part of the ſummer, it ſits on the tops of the higheſt trees, ſinging early in the morning, ſo loud as to pierce the ears; frequently kept in cages, in which it ſings through the year: ſometimes it is quite mute for a time, and again reſtleſs, hopping from perch to perch, and ſinging alternately. It inhabits North America; feeds on grain and Indian corn, which it hoards up.

CARLFONI. Red; chin black; rump, tail, wings, and legs brown. Inhabits the iſlands of the Indian ſea; it reſembles the cardinalis, but is not creſted.

BOETONENSIS; Indian groſbeak. Creſted, red; frontlet red; bill and legs yellow; the toes are long; claws ſharp, pointed; wing-coverts black. It inhabits India, and is about eight inches long.

MADAGASCARIENSIS; Madagaſcar groſbeak. Red, ocular band black, back ſpotted with blackiſh; the bill alſo is black; wings and tail brown edged with olive. It is about five inches and a half long, and inhabits Madagaſcar. The young birds at firſt are olive, and do not arrive at the red colour but by degrees.

MEXICANA; Mexican groſbeak. Red; wings and tail black. It inhabits New Spain, and is about ſix inches and a half long.

BRASILIANA; Braſilian groſbeak. Brown; beneath reddiſh, with ſpots annulate with black; head and middle of the belly red; creſcent on the nape and tip of the tail white; the bill is of a fleſh colour; wings and tail black; wing-coverts and ſecondary quill-feathers reddiſh at the tips. It is found in Brazil.

DOMINICANA; *Le gros-bec du Breſil*, Briſſon; *American bullfinch*, Willoughby. Black; head and chin ſcarlet; breaſt, belly, and edge of the quill-feathers white; the neck is blackiſh above; back, rump, and wing-coverts grey a little ſpotted with black; vent and ſides of the neck whitiſh; wings and tail black; legs cinereous. It inhabits Brazil. There is a variety; cinereous, beneath ſnowy; fore part of the head and throat red; tail-feathers black edged with cinereous, the outmoſt white on the outer edge. It is about the ſize of a lark.

CUCULLATA; Creſted Dominican groſbeak. Cinereous; creſted; head and chin ſcarlet; breaſt and belly white; tail long, the lateral feathers blackiſh. This, which by Latham is reckoned a variety of the Dominicana, and which is about the ſame ſize, inhabits Brazil.

SIBIRICA; Siberian groſbeak. Size of a linnet, but fuller of feathers. Bill ſomewhat longer than that of a bullfinch; round the baſe of it the feathers are of a deep purple; head and back in ſome birds of a deep vermilion; in others of a roſe-colour marked with brown, as in the linnet; the under parts paler, and not ſpotted. The female and young birds are of the colour of a linnet, with a tinge of red on the belly and rump.

This is a moſt beautiful ſpecies, and inhabits the buſhy ſhrubs about the rivers and torrents of the ſouthern mountains of Siberia, and particularly about lake Baikal; fond of the ſeeds of the blueiſh and other mugworts; it is a reſtleſs bird, and in winter unites into ſmall flocks, and keeps in warmer ſituations among the ſhrubs.

VIRGINICA; Yellow-bellied groſbeak. Head, neck, middle tail-feathers, and body beneath red; belly yellow; nape, lower part of the back, wings, and lateral tail-feathers olive. The bill is yellow, and the bird is found in Virginia.

CRISTATA; Creſted groſbeak. Whitiſh, front is creſted; the rump and legs are red; middle tail-feathers very long. It inhabits Ethiopia, and is one of the largeſt of its tribe. Creſt and breaſt in the male red, female white.

ERYTHROCEPHALA; Paradiſe groſbeak. *Le cardinal d'Angola*, Briſſon; *Sparrow of Paradiſe*, Edwards. Pale aſh; head purpliſh; breaſt ſpotted with white; bill and legs fleſh colour; chin red; body beneath; a double oblique band on the wings white. It inhabits Angola.

MAJA; White-headed groſbeak. Brown; head white. It inhabits Malacca and China, and is about four inches long. The head and neck are whitiſh, and ſo alſo are the ſecond and fourth quill-feathers.

FLAVICANS; Yellow groſbeak. Back greeniſh; head tawny; the wings and tail are of a greeniſh-yellow. It is the ſize of a canary bird, and is an inhabitant of Aſia.

BONARIENSIS; Marigold groſbeak. Head and neck blue; body above blackiſh, beneath yellow; belly and vent ſulphur; wings and tail blackiſh, edged with blue. It inhabits Buenos Ayres, where it is rarely ſeen till September; it frequents cultivated places and gardens; ſeen in pairs, and apparently very much attached to each other; feeds on graſs and on ſeeds. The bill is blackiſh; the legs are reddiſh; claws ſharp, curved, grooved, the hind-one very large.

ORYZIVORA; Java groſbeak. *Le gros-bec cendre de la Chine*, Briſſon; *Padda*, or *Rice bird*, Edwards. Cinereous; temples white; bill red. It inhabits China, Java, and Africa, is five inches long, and very deſtructive to rice plantations. The female has the bill and eye-lids very pale red, and wants the white on the cheeks; but the edge of the wing is white as well as the under tail-coverts. It is thought to be a Chineſe bird, by its being often met with on the paper hangings of that country. Latham thinks this the more likely, as he has ſeen it among ſome Chineſe paintings, in which it bore the name of "Hung-tzoy."

Flabellifera; Fan-tailed groſbeak. This ſpecies is the ſize of a ſparrow; length about five inches. Bill ſtout and duſky; the upper parts of the body are reddiſh-brown, paleſt on the rump; the under the ſame, but ſomewhat paler, and more inclined to red; quills, tail, and legs duſky. One of theſe birds had a grey breaſt and belly. They inhabit Virginia, where they are called fan-tails, and continually carry the tail ſpread in an horizontal direction.

Panicivora; White-winged groſbeak. Black; ſpurious wings black; bill fleſh-colour. It inhabits Africa, and is ſeven inches and a half long.

Malacca; Malacca groſbeak. Bay; head and belly black; bill blue; the breaſt and flanks are white; and the legs are brown. It inhabits Java and China, and is rather more than four inches long. There is a variety that is ferruginous, head and lower part of the neck black.

Molucca; Molucca groſbeak. Browniſh; head, throat, and tail-feathers black; the bill is black; hind-head brown; rump waved white and black; wings and legs brown. It inhabits the Molucca iſles.

Punctularia; Cowry groſbeak. Bay; belly black, ſpotted with white; the bill and legs black; hind-head and back reddiſh-brown; breaſt and flanks black, with hearted white ſpots, middle of the belly and vent white. It inhabits Java.

Undulata; Eaſtern groſbeak. Brown-red, beneath waved with brown; the tail is a pale red-aſh. It inhabits Aſia; is ſix inches long. The bill is ſhort and ſtrong.

Hordeacea; Yellow-rumped groſbeak. Tawny; temples white; tail and breaſt black. Inhabits India.

Sanguinirostris; Red-billed groſbeak. Grey, beneath white; bill and legs red; the front and face are black; breaſt and belly pale ochre; the feathers are ſometimes blackiſh in the middle; wings and tail brown. It inhabits ſome parts of Africa and Aſia.

Astrild; Waxed-bill groſbeak. Brown waved with blackiſh; bill, orbit, and breaſt ſcarlet. It inhabits the Canaries, America, and Africa; is about four inches long; hides itſelf under graſs and herbs, and feeds on ſeeds. There are two other varieties, *viz.* 1. Rump and vent ſcarlet. 2. Beneath roſy-white; crown, neck, and back blue; a ſcarlet band acroſs the eyes.

Leucura; White-tailed groſbeak. Bill and legs red; head and wing-coverts cinereous; back yellow; breaſt and belly yellowiſh; tail white, the outmoſt feathers black. It inhabits Brazil, and is three inches long.

Cyanea; Angola blue groſbeak. Blue; wings and tail black; the bill is of a lead-colour, irides hazel, legs black. It inhabits Angola.

Virens. Greeniſh; ſhoulders blue; wings and tail black, edged with green. It inhabits Surinam.

Angolensis; Angola groſbeak. Black-blue; belly ferruginous; wings with a white ſpot; the bill is black; wings edged with white; legs purpliſh-fleſh-colour. Found in and near Angola.

Ferruginea; Brown-headed groſbeak. Head and chin brown; body above black, beneath ferruginous; even tail and quill-feathers black, edged with yellow; the bill is of a horn colour, and the legs are pale; its length is about ſix inches.

Melanura; Grey-necked groſbeak. Head and tail black; neck above brown; throat and vent grey; belly reddiſh; vent white; quill-feathers black, the primaries near the tip, and the ſecondaries on the inner edge, are white. It inhabits China, and is the ſize of the hawfinch. The head of the female is grey.

Aurantia; Orange groſbeak. Orange; crown black; quill and tail-feathers black, edged with orange. The female has the whole head, and fore-part of the neck, black; the under part of the body white; the reſt of the body orange but leſs bright; and the quills edged with grey. It inhabits the iſle of Bourbon, but ſome ſpecimens have been ſent from the Cape.

Torrida; White-billed groſbeak. Black; breaſt and belly bay; middle tail-feathers very long. It inhabits South America.

Lineola; Lineated groſbeak. Black; the frontal line and temples are white. The body above is black-blue, and beneath it is white; bill black, with a white ſpot above the upper mandible; tail is forked; quill-feathers black, the primary white at the anterior baſe. It is found in many parts of Aſia and Africa.

Hamburgia; Hamburgh groſbeak. Head and neck cheſnut above; chin, band in the middle of the white throat, and rounded tail, brown; back, breaſt, and rump yellowiſh-brown, ſpotted with black; belly, vent, and two bands on the wing-coverts, white. It is about ſix inches long; inhabits Hamburgh and its neighbourhood; feeds on inſects, and climbs trees like a creeper.

Mexicana; Yellow-headed groſbeak. Spotted with brown; front, chin, rump, and eye-brows pale yellow. It inhabits New Spain, and is nearly ſix inches long.

* Chloris; Greenfinch. This is a well-known bird; the colour is a yellowiſh-green, paleſt on the rump and breaſt, and inclining to white on the belly: the quills are edged with yellow, and the four outer tail-feathers are yellow from the middle to the baſe; the bill is pale brown and ſtout; and the legs are fleſh-colour. The female inclines more to brown.

The greenfinch is common in Great Britain, and makes its neſt in ſome low buſh, hedge, &c. compoſed of dry graſs, lined with hair and wool; the female lays five or ſix eggs, marked at the larger end with red-brown: ſhe is ſo anxious and careful of her charge during incubation, that ſhe is often taken on the neſt. The male takes his turn in ſitting on the eggs. The greenfinch ſoon becomes tame; even old birds are familiar almoſt as ſoon as they are caught. It is apt to grow blind, like the chaffinch, if much expoſed to the ſun; it flies in troops in winter, and lives five or ſix years.

It is common in many parts of Europe, but in Ruſſia it is rarely ſeen, and never in Siberia, hence it is imagined that it ſhifts its quarters according to the ſeaſon. It is common in the northern parts of England and in many parts of Scotland.

Sinensis; Chineſe groſbeak. Head and neck greeniſh-grey; back pale brown; primary quill-feathers, the firſt half yellow, lower part black; ſecondaries within black, without grey, vent yellow. It inhabits China.

Butyracea; Yellow-fronted groſbeak. Greeniſh; head and back ſpotted with black, beneath yellow; bill, tail, quill-feathers, and legs black. The front, eye-brows, and temples are yellow; ſpots on the female brown and the tail tipt with white. It is found in India and at the Cape.

Dominensis; St. Domingo groſbeak. Green-brown, beneath pale rufous, ſpotted with brown; vent and area of the eyes white; wings black; tail and legs brown. It inhabits St. Domingo.

AFRICANA; African groſbeak. Varied with greeniſh-brown and grey, beneath white; breaſt varied with brown; primary quill and lateral tail-feathers edged with reddiſh-white, the outmoſt with a white ſpot. Inhabits the Cape of Good Hope.

HYPOXANTHA; Sumatra groſbeak. Yellowiſh; front and eye-brows pale yellow, quill and tail-feathers black, edged with yellowiſh. Inhabits Sumatra.

CANADENSIS; Canada groſbeak. *Le gros-bec de Cayenne*, Briſſon. Size of a houſe-ſparrow; bill aſh-colour, and the edges of it ſomewhat projecting in the middle; the upper parts of the plumage olive-green; the under paler, and inclining to yellow; the feathers round the baſe of the bill, and the chin, black; the legs are grey. It inhabits Cayenne and Canada, as its different names ſignify.

SULPHURATA; Brimſtone groſbeak. Olive-brown; throat and belly pale yellow; eye-brows yellow; it is about ſix inches in length, and inhabits in flocks near the Cape of Good Hope, frequents the banks of rivers, and builds a pendulous neſt, with a long neck beneath, in trees and ſhrubs.

FLAVINENTRIS; Yellow-bellied groſbeak. Olive ſpotted with brown, beneath yellow; quill and tail-feathers brown, edged with olive; above the eyes a yellow ſtripe; the rump is olive coloured; tail forked; legs grey. Inhabits the Cape of Good Hope. There is a variety; hind-head, cheeks, and chin cinereous.

COLLARIA; Nun groſbeak. Yellowiſh; breaſt and collar yellow; temples black. There is a variety with a broader collar. Inhabits India and Angola.

GRISEA; Grey groſbeak. Blue-grey, neck and front white; bill and claws brown, legs reddiſh.

BENGALENSIS; *Le moineau de Bengale*, Briſſon. *Yellow-headed Indian ſparrow*, Edwards. *Bengal groſbeak*, Linn. Grey; crown yellow, temples whitiſh; belly whitiſh; ſpotted with brown. "This bird," ſays ſir William Jones, "is exceedingly common in Hindooſtan; he is aſtoniſhingly ſenſible, faithful, and docile; never voluntarily deſerting the place where his young are hatched, but not averſe, like moſt other birds, to the ſociety of mankind; and eaſily taught to perch on the hand of his maſter. In a ſtate of nature he generally builds his neſt on the higheſt tree he can find; eſpecially on the Palmyra, or on the Indian fig-tree, and he prefers that which happens to overhang a well or a rivulet: he makes it of graſs, which he weaves like cloth, and ſhapes like a bottle, ſuſpending it firmly on the branches; but ſo as to rock with the wind, and placing it with its entrance downward, to ſecure it from the birds of prey. Its neſt uſually conſiſts of two or three chambers; and it is popularly believed that he lights them with fire-flies, which he is ſaid to catch alive at night, and confine with moiſt clay or with cow-dung. That ſuch flies are often found in his neſt, where pieces of cow-dung are alſo ſtuck, is indubitable; but as their light could be of little uſe to him, it ſeems probable that he only feeds on them. He may be taught with eaſe to fetch a piece of paper, or any ſmall thing that his maſter points out to him. It is an atteſted fact, that if a ring be dropped into a deep well, and a ſignal be given to him, he will fly down with amazing celerity, catch the ring before it touches the water, and bring it up to his maſter with apparent exultation; and it is confidently aſſerted, that if a houſe, or any other place, be ſhewn to him once or twice, he will carry a note thither immediately on a proper ſignal being made. The young Hindoo women at Benares, and in other places, wear very thin plates of gold called *ticas*, ſlightly fixed, by way of ornament, between their eye-brows; and when they paſs through the ſtreets, it is not uncommon for the youthful libertines who amuſe themſelves with training theſe birds, to give them a ſignal which they underſtand, and ſend them to pluck the pieces of gold from the foreheads of their miſtreſſes, which they bring in triumph to their lovers.

MALABARICA; Malabar groſbeak. Cinereous; quill and tail-feathers black; chin and vent white; the bill is black. It inhabits India.

AFRA; Black-bellied groſbeak. Beneath black; head, flanks, and tail-coverts yellow; wings and tail browniſh. It is found in Africa.

CAFFRA. Black, quill-feathers brown; ſhoulders red; plumage ſilky; bill brown-aſh; quill-feathers at the edges and coverts white; tail longer than the body; legs grey. It is of the ſize of a bull-finch, and inhabits the Cape of Good Hope.

TOTTA. Quill and tail-feathers all black, the very tips white; the body is of a browniſh colour, but beneath is a pale orange; front greeniſh-brown; it has ſix primary quill-feathers; eight ſecondary; ten tail-feathers beneath ſooty; ſhanks yellowiſh; legs black.

INDICA; Aſh-headed groſbeak. Blackiſh, beneath whitiſh; head and neck cinereous; tail tipt with white. Inhabits India; is very ſmall; and has blue legs and bill.

ASIATICA; Aſiatic groſbeak. Reddiſh-aſh, beneath cinereous; belly pale red; head, greater wing-coverts, quill-feathers, and tip of the tail black. It inhabits China, and is the ſize of a bull-finch. There is a variety; blueiſh-aſh; head, wings, and tail black; quill and two middle tail-feathers and tip of the tail black.

CANORA; Brown-cheeked groſbeak. Dirty greeniſh, beneath cinereous; cheeks brown, ſurrounded with a yellow fringe. It inhabits Mexico, and ſings charmingly.

LINEATA; Radiated groſbeak. Black, beneath white; ſides of the body, and baſe of the primary quill-feathers, tranſverſely ſtreaked with white and black.

PERLATA; Pearled groſbeak. Black, beneath brown; near the tail varied with white and black. It inhabits Africa.

FASCIATA; Faſciated groſbeak. Browniſh, with black creſcents; quill-feathers, tail, and cheeks brown, under the chin a broad red band; the bill is blueiſh-grey, and the legs are of a fleſh-colour. It inhabits Africa.

CANTANS; Warbling groſbeak. Brown, tranſverſely lined with blackiſh, beneath white; tail brown, wedged. It inhabits Africa, and is about four inches long. A variety of this ſpecies has a yellowiſh belly; chin and ſides waved white and blackiſh, and is named the Gambia groſbeak.

MELANOCEPHALA; Black-headed groſbeak. Pale yellow; head black; bill cinereous; throat and irides black; legs blue-aſh. It is about ſix inches long, and inhabits Gambia.

ERYTHROMEAS. Red; head and chin black; the bill is black, white at the baſe; tail rounded. Female above greeniſh-orange, mixed with red, beneath orange; quill-feathers olive, the outer edge rufous.

CORONATA; Black-creſted groſbeak. Scarlet, beneath blue; creſt on the head and ſpot in the middle of the throat black. It inhabits America.

CANA; Cinereous groſbeak. Hoary; quill and tail-feathers brown, legs red; bill cinereous; greater quill-feathers white at the baſe, blackiſh at the tips; tail blackiſh, edged with pale aſh; legs fleſh colour.

PHILIPPINA; Philippine groſbeak. Brown, beneath yellowiſh-white ; crown and breaſt pale yellow ; chin brown. The female has the upper parts brown, margined with rufous ; rump of this laſt colour ; legs yellowiſh. Theſe inhabit the Philippine iſlands, and are noted for making a moſt curious neſt, in form of a long cylinder, ſwelling out into a globoſe form in the middle. This is compoſed of the fine fibres of leaves, and faſtened by the upper part to the extreme branch of a tree. The entrance is from beneath ; and after aſcending the cylinder as far as the globular cavity, the true neſt is placed on one ſide of it, where, ſays Latham, this little architect lays her eggs, and hatches her brood in perfect ſecurity. There are three diviſions in the neſt of this bird ; the firſt is occupied by the male, the ſecond by the female, and the third contains the young ; in the firſt apartment, where the male keeps watch, while the female is hatching, a little tough clay is placed on one ſide, and on the top of this clay a glow-worm, which is ſaid to afford it inhabitants light in the night-time.

There is a variety of this ſpecies. Tail and quill-feathers greeniſh-brown, edged with yellow. Inhabits Abyſſinia. This makes a neſt ſomewhat like the former, of a ſpiral ſhape, not unlike that of a nautilus. It ſuſpends it, like the other, on the extreme twig of ſome tree, chiefly one that hangs over ſome ſtill water ; and always turns the opening towards that quarter from whence leaſt rain may be expected.

Abyssinica ; Abyſſinian groſbeak. Yellowiſh ; crown, temples, throat, and breaſt black ; ſhoulders blackiſh ; quill and tail-feathers brown, edged with yellow. It inhabits Abyſſinia ; ſize of the hawfinch ; makes a pyramidal pendent neſt, the opening of which is on one ſide, facing the eaſt ; it is divided in the middle by a partition, and the neſt is within this cavity on one ſide ; by this means it is ſecure from the intruſion of ſnakes, ſquirrels, monkies, and other miſchievous animals, and defended from the weſterly rains, which laſt for ſeveral months almoſt unceaſingly.

Pensilis ; Penſile groſbeak. Green ; head and throat yellow ; ocular band green ; belly grey ; vent rufous-red ; bill, legs, tail and quill-feathers black, the laſt edged with green. This ſpecies inhabits Madagaſcar ; is the ſize of a houſe-ſparrow ; conſtructs its penſile neſt of ſtraw and reeds, ſhaped like a bag, with an opening beneath, on one ſide of which is the true neſt. The bird does not chooſe a new ſituation every year, but faſtens a new neſt to the end of the laſt ; ſometimes as far as five, one hanging from another ; builds in large ſocieties, and brings three young ones at each hatch.

A bird ſimilar to this is mentioned in Kæmpfer's Hiſtory of Japan, which makes the neſt near Siam, on a tree, with narrow leaves and ſpreading branches, the ſize of an apple-tree ; the neſt in the ſhape of a purſe, with a long neck, made of dry graſs and other materials, and ſuſpended at the end of the branches ; the opening always to the north-weſt. The hiſtorian ſays he counted fifty on one tree only ; and deſcribes the bird itſelf as being like a canary-bird in colour, but as chirping like a ſparrow.

Socia ; Sociable groſbeak. Rufous brown, beneath yellowiſh ; frontlet black ; tail ſhort. This ſpecies inhabits the interior parts of the Cape of Good Hope : they live together in vaſt tribes under one common roof, containing ſeveral neſts, which are built on a large ſpecies of mimoſa ; this, from its ſize, its ample head, and ſtrong wide ſpreading branches, is well calculated to admit and ſupport their dwellings. The tallneſs and ſmoothneſs of its trunk are alſo a perfect defence againſt the invaſions of the ſerpent and the monkey tribes ; in one tree deſcribed by a very intelligent traveller, Mr. Paterſon, there were ſeveral hundred neſts under one general roof. It is deſcribed as a roof, becauſe it reſembles that of a thatched houſe, and projects over the entrance of the neſt below in a ſingular manner. "The induſtry of theſe birds," ſays this author, "ſeems almoſt equal to that of the bee. Throughout the day they ſeem to be buſily employed in carrying a fine ſpecies of graſs, which is the principal material they uſe for the purpoſe of erecting this extraordinary work, as well as for additions and repairs. Though my ſhort ſtay in the country was not ſufficient to ſatisfy me by ocular proof that they added to their neſt as they annually increaſed in numbers ; ſtill, from the many trees which I have ſeen borne down by the weight, and others which I have obſerved with their boughs completely covered over, it would appear that this is really the caſe. When the tree, which is the ſupport of this aerial city, is obliged to give way to the increaſe of weight, it is obvious that they are no longer protected, and are under the neceſſity of building in other trees. One of theſe deſerted neſts I had the curioſity to break down, to inform myſelf of the internal ſtructure of it ; and found it equally ingenious with that of the external. There are many entrances, each of which forms a regular ſtreet, with neſts on both ſides, at about two inches diſtance from each other. The graſs with which they build is called the Boſhman's graſs, and I believe the ſeed of it to be their principal food ; though, on examining their neſts, I found the wings and legs of different inſects. From every appearance the neſt which I diſſected had been inhabited for many years, and ſome parts of it were much more complete than others. This, therefore, I conceive to amount nearly to a proof that the animals added to it at different times, as they found neceſſary from the increaſe of the family, or rather of the nation or community."

Striata ; Striated groſbeak. Brown, ſtreaked with ferruginous, beneath white ; throat black. About the ſize of a wren. It inhabits Bourbon.

Zeylonica ; Ceylon groſbeak. Ferruginous brown, beneath purple, waved with black ; front and rump blueiſh. Inhabits Ceylon.

Ludoviciana ; Louiſiana groſbeak. Black ; breaſt, belly, band on the wings, and baſe of the quill-feathers white. Inhabits North America, and is about ſix inches long. There is another variety with a roſy breaſt.

Maculata ; Spotted groſbeak. Feathers of the upper part of the body black, ſpotted with white towards the tip, of the lower part whitiſh, ſtreaked with black ; quill and tail-feathers whitiſh on the outſide. It inhabits America.

Obscura ; Duſky groſbeak. Middle of the throat, and double band on the wing-coverts white ; quill-feathers green, flanks white, ſpotted with brown ; feathers of the head, neck, and back edged with brown. Inhabits in the neighbourhood of New York.

Hudsonica ; Hudſon's Bay groſbeak. Brown ; belly white, ſides ſpotted with brown ; wing-coverts with two red bands. It inhabits Hudſon's Bay, from whence it derives its name. It has ſtrong bill and legs ; feathers of the back and rump, ſecondary quills and tail-feathers edged with pale rufous ; tail a little forked.

Capensis ; Cape groſbeak. Blackiſh-brown ; rump and wing-coverts pale yellow. There is a variety with feathers above browniſh, in the middle ſpotted with black, beneath whitiſh, ſpotted with black. The bill and legs black ; feathers of the head ſhort, and in breeding time ſilky ; wings cheſnut, edged with grey ; greater quill-feathers edged with yellow, back ſometimes pale yellow. Inhabits

Coromandel and the Cape; is found chiefly in thickets near rivers; eggs cinereous, ſpotted with black.

Nigra; Black groſbeak. *Le bouvreuil noir du Mexique*, Briſſon and Buffon. *Little black bullfinch*, Cateſby, Albin. &c. This ſpecies is of the ſize of a bullfinch; the bill is black, ſtout, and deeply notched in the middle of the upper mandible; plumage black, except a little white on the fore-part of the wing, and baſe of the two firſt quills; legs black. Inhabits Mexico.

Crassirostris; Thick-billed groſbeak. Black; baſe of the quill-feathers, and middle tail-feathers in the middle white; legs whitiſh; the bill is thick and yellowiſh.

Regulus; Crimſon-creſted groſbeak. Bill very thick and ſtrong. There was a fine ſpecimen of this bird in the Leverian muſeum.

Americana; Black-breaſted groſbeak. Black; beneath white; pectoral band black; wings with a double white band; tail rounded; legs brown. It inhabits America.

Cærulea; Blue groſbeak. *Le bouvreuil bleu de la Caroline*, Briſſon. This ſpecies is the ſize of the bullfinch: bill half an inch, ſtout, and brown; the baſe of it ſurrounded with black feathers, which reach on each ſide as far as the eye; the whole plumage beſides is of a deep blue, except the quills and tail, which are brown with a mixture of green, and acroſs the wing-coverts a band of red; the legs are duſky. The female is brown with a little mixture of blue.

"I ſuſpect," ſays Latham, "this to be Bancroft's bird, which he ſays is ſky-blue, with the outer edges of the quills and tail crimſon; and the more ſo, as I have lately met with one from Cayenne, which had the chin, as well as round the bill, black, and both the ſhoulders, ſome of the wing-coverts, and the edges of the ſecondaries, marked with reddiſh."

Urix; Grenadier groſbeak. Grey; bill, front, and belly black; neck and rump tawny; ſometimes the wings are white, and the tail is brown. It is the ſize of a ſparrow; inhabits Africa, and is found chiefly in marſhy grounds and among the reeds. The neſt is formed with ſmall twigs, ſo cloſely interwoven with cotton, as not to be penetrated in any weather. It is divided into two compartments, of which the upper is for the male, and the lower for the female and the young.

Flamingo. White; head, neck and breaſt, and belly roſy. Inhabits Upſal; reſembles the bullfinch; bill and legs reddiſh; feathers of the frontlet blackiſh at the tips; third and fourth quill-feathers and ſpot on the rump black; tranſverſe line on the wings and upper ſurface of the tail ſooty.

Violacea; Purple groſbeak. *Le bouvreuil violet de Bahama*, Briſſon. *Black ſparrow*, Raii Syn. This is the ſize of the ſparrow; bill is black; plumage violet black, except the irides, a ſtreak over the eye, the chin, and the vent, which are red; legs duſky grey. Where the male is black, the female is brown, and the red is not ſo bright; it inhabits the Bahama iſlands, Jamaica, and the warmer parts of America

Grossa; White-throated groſbeak. Blueiſh hoary; throat and tail-feathers blackiſh; chin white; bill red. Inhabits America.

Minima; Dwarf groſbeak. Brown; beneath teſtaceous; primary quill-feathers at the baſe and ſecondaries on the hind-part white. This ſpecies is very ſmall; it inhabits Surinam.

Fusca; Brown groſbeak. *Le petit bouvreuil noir d'Afrique*, Briſſon. Size of a canary bird; bill ſhort and thick, and of a lead colour; the head and upper parts of the body brown; the under of a pale aſh-colour; vent pure white; the quills duſky black; the baſe of eight of the middle quills white; tail the colour of the quills, with paliſh ends; legs pale. It is an inhabitant of Africa, and is met with at Bengal.

Guttata. Brown; breaſt black; bill and rump red; ſides of the body black ſpotted with white. It inhabits New Holland.

Septentrionalis; Northern groſbeak. Black; wings with a white ſpot. Inhabits Scandinavia; reſembles the bullfinch.

Minuta; Minute groſbeak. Grey; rump and belly beneath ferruginous; ſome quill-feathers on each ſide white at the baſe; tail entire. It inhabits Surinam and Cayenne; is very ſmall, active, and bold; frequents inhabited places, and feeds on ſeeds and fruit. Bill and legs brown; cries like a ſparrow; makes a roundiſh neſt, compoſed of a reddiſh herb, and placed on the trees which it frequents.

Bicolor; Orange-bellied groſbeak. Brown; beneath red: another variety; browniſh, beneath white; chin ſomewhat ferruginous. Inhabits India; the bill is whitiſh and legs are brown.

Prassina; Red-rumped groſbeak. Olive-green, beneath yellowiſh hoary, rump pale red; legs yellow. This is the deſcription of the male; the female of a variety is olive brown, beneath yellowiſh hoary; rump pale red; legs yellowiſh.

Tridactyla; Three-toed groſbeak. *Le Guifso Balito*, Buffon. Bill toothed on the edges; the head, throat, and fore-part of the neck of a beautiful red, which is prolonged in a narrow band quite to the vent; the upper part of the neck, back, and tail black; the wing-coverts brown, edged with white; quills brown, with greeniſh edges; legs dull red; the wings reach half way on the tail; the toes three only, two before and one behind.

This inhabits Abyſſinia; frequents woods, and is a ſolitary ſpecies; feeds on kernels and ſeeds, which it breaks with the greateſt eaſe with its bill. Latham, Lewin, Gmelin's Linnæus, &c. &c.

LOXOCARYA, in *Botany*, from λοξος, *oblique*, and καρυον, *a nut.* Brown Prodr. Nov. Holl. v. 1. 249. This genus is ſeparated from *Reſtio*, ſolely on account of its having an undivided ſtyle, and a fruit of one cell, which is as it were a third part, or one lobe, of that of *Reſtio.* We preſume to think this diſtinction ſcarcely ſufficient. One ſpecies only is mentioned.

L. *cinerea*; found by Mr. Brown in the ſouth part of New Holland.

LOXODROMIC Table. See Table.

Loxodromics, the art or method of oblique ſailing, by the loxodromy, or rhumb.

LOXODROMY, Loxodromia, formed of λοξος, *oblique*, and δρομος, *courſe*, the line which a ſhip deſcribes in ſailing on the ſame collateral rhumb.

The loxodromy, called alſo the *loxodromic line*, cuts all the meridians in the ſame angle, called the *loxodromic angle.* This line is a ſpecies of the logarithmic ſpiral, deſcribed on the ſurface of the ſphere, having the meridians for its radii.

LOYAL, in the *Manege*. A horſe is ſaid to be loyal, that freely bends all his force in obeying and performing any manege he is put to; and does not defend himſelf, or reſiſt, notwithſtanding his being ill treated.

A loyal mouth is an excellent mouth, of the nature of ſuch as we call mouths with a full reſt upon the hand.

LOYALSOCK Creek, in *Geography*, a river of America,

rica, in Northumberland county, Pennſylvania, which runs into the W. ſide of the branch of Suſquehannah river, from the N.E.; 26 miles from Sunbury. It is navigable 20 or 30 miles up for batteaux of 10 tons. N. lat. 41° 15′. W. long. 77° 1′.

LOYHA, a ſmall iſland on the E. ſide of the gulf of Bothnia. N. lat. 65° 6′. E. long. 25°.

LOYOLA, Ignatius de, in *Biography*, celebrated as the founder of the order of Jeſuits, was deſcended from a noble Spaniſh family, and born in 1491, at the caſtle of Loyola, in the province of Guipuſcoa, whence he derived his ſurname. At an early age he was appointed page at the court of Ferdinand and Iſabella, and was ſhewn diſtinguiſhed marks of favour. But the indolence and ſameneſs of a courtier's life did not accord with young Loyola's active diſpoſition; he panted for fame, and to attain to a conſpicuous ſituation, he determined to enter into the army. He was taken under the patronage of the duke de Nájara, a grandee of Spain, a ſoldier of high reputation, and under his auſpices, he paſſed through different degrees of military rank, and diſcovered on all occaſions great courage, and a ſtrong attachment to the ſervice. His morals, which had been corrupted at court, were not reformed in the army, where, following the example of thoſe about him, he addicted himſelf to the licentiouſneſs too prevalent in the military life; he was, however, poſſeſſed of a high ſenſe of honour, was frank, diſintereſted, and generous, and much beloved by thoſe who ſerved under him. In 1521, he had the command of the citadel of Pampeluna, then beſieged by the French, and after diſplaying the utmoſt valour in repulſing the enemy, he was in a moment diſabled by a ſevere wound in the left leg, and by a cannon ſhot which broke his right. The garriſon having thus loſt the example of their leader, ſurrendered at diſcretion. The French paid every attention to Loyola, and as ſoon as he was in a ſtate fit to be moved, they ſent him in a litter to his native place. It was a conſiderable time before a cure was effected, and during that period he happened to have no other ſource of amuſement than what he found in reading the lives of the ſaints, the effect of which on his mind, was to inſpire him with a deſire of emulating the glory of the moſt celebrated among them. From this time he reſolved to renounce the vanities of the world, to viſit the Holy Land, and to devote himſelf to an auſtere religious life. Hence he undertook a pilgrimage to our lady of Montſerrat, to hang up his arms near her altar. His zeal at this time was without all bounds; he attempted to take away the life of a perſon who ſuggeſted a doubt whether the Virgin Mary had remained pure and immaculate after her delivery. Having arrived at Montſerrat, he adopted a new method of conſecrating himſelf to the ſervice of the Virgin; he ſtripped off his clothes, which he gave to a poor man, put on a coarſe garment of ſackcloth, girded himſelf with a cord, from which was ſuſpended a gourd for carrying water, put a matted ſhoe on one foot, which had not yet recovered the injury produced by his wounds, leaving the other naked and his head expoſed to the violence of the weather, and ſubſtituting in the place of his lance a plain crab-tree ſtaff. Thus equipped, he preſented himſelf before the altar of the Holy Virgin, hung his military weapons on a pillar near the altar, and watched all night, ſometimes kneeling and ſometimes ſtanding, devoting himſelf as a champion. Early in the following morning Loyola departed on foot for Manreſa, three leagues from Montſerrat, intending to go through a courſe of penance, by way of preparation for his expedition to the Holy Land. He underwent, for the ſpace of twelve months, the moſt rigorous mortifications of every kind, after which he commenced his labours of ſpiritual exhortation, both in private families and in public places, and in a very ſhort time he publiſhed his book entitled "Spiritual Exerciſes." Loyola, intent upon viſiting the Holy Land, embarked for Italy, and proceeded to Rome to obtain the pope's bleſſing, which he obtained from Adrian VI. with leave to purſue his pilgrimage to Jeruſalem. After viſiting the ſcenes of our Saviour's principal tranſactions in that city, and the ſurrounding country, and going through the exerciſes uſually performed by pilgrims, Loyola formed the deſign of remaining in Paleſtine, for the purpoſe of devoting himſelf to the converſion of the inhabitants of the Eaſt. This deſign he communicated to the father guardian of the Franciſcans, by whom he was referred to the father-provincial, who, aware of the danger of the enterpriſe, refuſed his conſent, and ſent Loyola back to Europe. At Barcelona he commenced a courſe of ſchool learning, which he completed in two years, and then went to the univerſity of Alcala de Henares, where he ſuffered himſelf to be diverted to other objects beſides literature, and of courſe made but a mean progreſs in his ſtudies. He had taken as his model the works of Thomas à Kempis, which he was perpetually reading. He ſpent a conſiderable portion of his time in the ſervice of the ſick, in begging excurſions, and in inſtructing and exhorting the people. Loyola had now aſſociated himſelf with four companions who imitated his plans of life, and looked up to him as a maſter and leader. Their different dreſs, and extraordinary manner of living, induced multitudes to become their followers: this awakened the jealouſy of the inquiſitors, who inſtituted enquiries relative to Loyola's doctrine and behaviour, and having found that he was a believer in the ſound faith, he was diſmiſſed. After this he was ſome time impriſoned on the ſuſpicion of having perſuaded a lady of rank and her daughter to undertake a long pilgrimage barefoot. Being liberated, he went to Salamanca, and was a ſecond time impriſoned through the interference of the Dominican monks, who were jealous of his popular exertions in a religious courſe. He was now determined to abandon his native country, where he was ſubject to ſo many hindrances in what he conceived the way of his duty: he accordingly went to Paris in 1528, where he re-commenced the ſtudy of the Latin language at Montague college; went through a courſe of philoſophy in the college of St. Barbara, and ſtudied divinity under the Dominicans. His zeal in inſtructing others expoſed him to trouble in Paris, as it had done in the Spaniſh univerſities, and he narrowly eſcaped whipping in St. Barbara's college-hall. No ſuffering had the effect of cooling his zeal; he formed an aſſociation among the ſcholars of that college, the members of which took a vow to conform to a ſtrict religious diſcipline, and to engage in a new undertaking for promoting the intereſts of the Catholic faith. They agreed to preach in public places, and in every place where they could obtain permiſſion, recommending the beauty and rewards of virtue, and pointing out the deformity and puniſhments of vice, and this in a ſimple evangelical manner, without the vain ornaments of eloquence; that they ſhould inſtruct children in the Chriſtian doctrine, and the principles of right conduct, and that they ſhould receive no money for exerciſing their functions, but be governed in all their proceedings by a view to the glory of God. The ſociety thus formed was to be denominated "The Company of Jeſus." Loyola was now anxious to obtain the approbation of the pope, in order that a new inſtitution might be formed under his ſanction. His holineſs, Paul III. referred the petition of Loyola to the committee of cardinals, who violently oppoſed the eſtabliſhment of ſuch an order, repreſenting it not only as unneceſſary but extremely dangerous. He again threw himſelf at the feet of the pope, and propoſed that beſides the three vows of poverty, chaſtity, and monaſtic obedience, which are common to all the orders of regulars, the members of his ſociety ſhould take a fourth vow, of obedience to the pope, binding themſelves to go whitherſoever he ſhould command for the ſervice of religion, and without requiring any thing from the holy ſee for their ſupport. This was a propoſal which the pope could not reject; he confirmed the inſtitution of the Jeſuits by a bull, granted the moſt ample privileges to the members of the ſociety, and appointed Loyola to be the firſt general of the order. (See our article JESUITS.) In 1550, he was deſirous of reſigning his office of general, but the ſociety would not conſent to the meaſure, and he retained it till his death in 1556, when he was in the ſixty-ſixth year of his age. Before that event, he had ſeen his order ſpread over the greateſt part of the old and new worlds, and he had eſtabliſhed, in the ſhort ſpace of ſixteen years, twelve large provinces, containing at leaſt an hundred colleges. He was beatified by pope Paul V., and in 1622 he was canonized by Gregory XV. Bayle. Moreri. Robertſon, and art. Jeſuits.

LOYOLA, in *Geography*, a village of Spain, in the province of Guipuſcoa, formerly belonging to the family of Ignatius, founder of the order of Jeſuits. See JESUITS.—Alſo, a town of South America, in the audience of Quito; 50 miles S. of Loxa.

LOZE, a river of Congo, in Africa, which runs into the Atlantic, navigable for boats, but having no harbour at its mouth. S. lat. 7° 55′.

LOZENGE, or LOZANGE, in *Geometry*, a kind of parallelogram, or quadrilateral figure, conſiſting of four equal and parallel lines or ſides, whoſe angles are not right, but whereof two oppoſite ones are acute, and the other two obtuſe; the diſtance between the two obtuſe ones being always equal to the length of one ſide.

Scaliger derives the word lozenge from *laurengia;* this figure reſembling, in ſome reſpects, that of a laurel leaf. In geometry, it is ordinarily called *rhombus;* and, when the ſides are unequal, *rhomboides*.

LOZENGE, in *Heraldry*, is a rhombus, or figure of equal ſides, but unequal angles; reſembling a quarry of glaſs in our old windows; placed erect, point-ways. It is in this figure that all unmarried gentlewomen and widows bear their coats of arms; becauſe, as ſome ſay, it was the figure of the Amazonian ſhield; or, as others, becauſe it is the ancient figure of the ſpindle.

The lozenge differs from the *fuſil*, in that the latter is narrower in the middle, and not ſo ſharp at the ends.

LOZENGES, among *Jewellers*, are common to brilliant and roſe diamonds. In the former they are formed by the meeting of the ſkill and ſtar-facets on the bezil; in the latter, by the meeting of the facets in the horizontal ribs of the crown.

LOZENGE is alſo a ſort of medicine, made into ſmall pieces, to be held or chewed in the mouth till they are melted there; the ſame with what are otherwiſe called *trochiſci, troches*.

LOZERE, in *Geography*, one of the nine departments of the ſouthern region of France, compoſed of Gevaudan and part of the Cevennes, N. lat. 44° 30′, S.E. of Cantal, and S. of the Upper Loire, 18 French leagues long, and 15 broad, contains 5390 kiliometres, or 269 ſquare leagues, and 155,927 inhabitants. It is divided into three diſtricts, 24 cantons, and 193 communes. The diſtricts are Marvejols, including 60,750 inhabitants; Mende, 52,813; and Florac, 42,364. Its capital is Mende. Its contributions amount to 892,776 fr. and its expences to 179,687 fr. The northern diſtricts conſiſt partly of granite mountains; towards the middle of the department the hills are calcareous; and in the ſouthern part the Cevennes are compoſed of ſchiſtus. A conſiderable proportion of this territory is not ſuſceptible of culture. The chief products are barley, flax, hemp, fruits, and paſtures for ſheep. Here are mines of iron, copper, lead, and antimony, with mineral ſprings.

LOZICZE, a town of Poland, in the palatinate of Bielſk; 56 miles S.W. of Bielſk.

LOZZI, a town of the iſland of Corſica; 11 miles N.W. of Corte.

LOZZO, a town of Italy, in the Paduan; 8 miles S.S.W. of Padua.

LU, a town of France, in the department of Marengo; 8 miles W. of Alexandria.

LU, in *Chineſe Muſic*, implies a key. Dividing the octave into 12 ſemitones, they give the name of *lu* to each, numerically. See CHINESE MUSIC.

LUA, in *Geography*, a river of the iſland of Cuba, which runs into the ſea; 25 miles N.E. of Cape Cruz.—Alſo, a town of Arabia, in the province of Oman, on the coaſt; 10 miles N. of Sohar.

LUA, in *Mythology*, a Roman divinity mentioned by Livy, lib. viii. and invoked in war. The name is ſuppoſed to be derived from *luere, to expiate*.

LUABO, in *Geography*, a river on the W. coaſt of Africa, a branch of the great river Zambezi, which ſeparates from it at the diſtance of 30 leagues from the ſea.—Alſo, an iſland ſituated between the Luabo and Zambezi. See MOCARANGA.

LUANA POINT, a cape on the S. coaſt of Jamaica. N. lat. 18° 2′. W. long. 77° 50′.

LUANCO, a town of Spain, in Aſturia, near the W. coaſt; 20 miles N. of Oviedo.

LUANZA, a town of Africa, in the country of Mocaranga. S. lat. 17° 15′. E. long. 32° 30′.

LUARCA, a ſea-port town of Spain, on the N. coaſt, in the province of Aſturias; 30 miles N.W. of Oviedo.

LUBAD, a town of Aſiatic Turkey, in Natolia, on a lake of the ſame name, 21 miles long, and four broad; 7 miles S. of Burſa.

LUBAN, a town of Lithuania, in the palatinate of Novogrodek; 20 miles S.E. of Sluck.

LUBAN, or *Louban*, one of the Philippine iſlands, about 12 miles in circumference.

LUBARTOW, a town of Poland, in Volhynia; 36 miles W. of Berdiczow.

LUBASZYN, a town of Lithuania, in the palatinate of Minſk; 52 miles E. of Minſk.

LUBAT, a town of Aſiatic Turkey, in Natolia; 28 miles W. of Burſa.

LUBATCHOW, a town of Auſtrian Poland, in Galicia; 16 miles N. of Lemberg.

LUBBECKE, or LUTHICKE, a town of Weſtphalia, in the county of Minden, conſiſting of about 258 dwelling-houſes, which obtained the privileges of ſaints in 1270, and was ſurrounded with ramparts, ditches, and walls. This town enjoys ſeveral immunities, and particularly a territorial juriſdiction over a conſiderable diſtrict. Its chief trade conſiſts in yarn and linen, breeding of cattle, and brewing of beer. It has ſuſtained, at ſeveral times, great damage by fire; 14 miles W. of Minden.

LUBBEN, or LUBIO, a town of Lower Luſatia, ſituated on the Spree, in a circle to which it gives name;

56 miles S. of Berlin. N. lat. 51° 37′. E. long. 13° 45′.

LUBBERT, Sibrand, in *Biography*, a theological profeſſor and divine, was born at Langoworde, in Frieſland, about the year 1556. He ſtudied in the colleges of Bremen and Wittemberg. He afterwards went to Geneva, and diligently attended the lectures of Beza, Caſaubon, and Francis Portus. From Geneva he went to Newſtadt, and attended the lectures of the learned Zachary Urſinus, who, after a time, recommended him as his own ſucceſſor as profeſſor of logic, an honour which he declined, and accepted ſoon after an invitation to become paſtor of a congregation at Embden. The duties of this office he diſcharged with ſingular fidelity and zeal. In 1584, he removed to Frieſland, and was appointed preacher to the governor and deputies of the ſtates of that province; alſo profeſſor of divinity in the new univerſity of Franeker. He went to Heidelberg, where he was admitted to the degree of doctor of divinity, and then returned to his profeſſorſhip, which he occupied with reputation nearly forty years. During this period he was often employed in very important affairs. He died at Franeker in 1625, at the age of ſixty-nine. He was author of many learned pieces againſt Bellarmin: he publiſhed a work againſt Socinus, and he wrote againſt Arminius, Vorſtius, Grotius, and the other defenders of the cauſe of the Remonſtrants. His laſt work was a commentary on the Catechiſm of Heidelberg. Bayle. Moreri.

LUBCZ, in *Geography*, a town of Ruſſian Lithuania; 25 miles N. of Novogrodek.

LUBECK, a city of Germany, one of the three cities of the Hanſeatic league, acknowledged as ſuch, together with Hamburgh and Bremen, in the definitive treaty of indemnities, 25th of February 1803, with the guarantee of their juriſdiction and perpetual neutrality. It is alſo one of the college of imperial and free cities. It is ſituated within the limits of Holſtein, on the navigable river Trave, communicating by ſeveral ſtreams with the Baltic and German ocean. The town ſtands on the two declivities of a long hill, moderately high, the eaſtern part extending towards the navigable river Wackenitz, and the weſtern towards the Trave. Beſides walls and towers, it is alſo ſurrounded by ſtrong ramparts, and wide moats. The ſtreets are for the moſt part ſteep, and the houſes built of ſtone, and old faſhioned, the doors being ſo large as to admit carriages into the hall, which ſerves frequently for a coach-houſe. The eſtabliſhed religion, ever ſince the year 1530, has been Lutheraniſm. It has four parochial churches, as well as the cathedral of an ancient ſee. The archbiſhopric of Lubeck lies in that part of the duchy of Holſtein, which was anciently called "Wagria." Its ſee was firſt erected by the emperor Otho I. at Oldenburg, in 951, for the converſion of the Wends, or Veneti, who inhabited this country, and transferred to Lubeck in the year 1164. The reformation of the dioceſe was begun under biſhop Henry of Bocholt, and being promoted by his ſucceſſors, was accompliſhed in 1561. The biſhop of Lubeck, though a prince of the empire, yet in the college of princes ſat neither on the ſpiritual nor temporal bench, but on a particular bench placed croſs-ways, and laid there for him and the biſhop of Oſnabruck, when a Lutheran. He had alſo a vote among the princes of the circle of Lower Saxony. The cathedral ſtands in the imperial city of Lubeck: but is inveſted with no authority. The chapter conſiſts of thirty perſons, who, with the exception of four Roman Catholics, are all Lutherans. When the indemnities were ſettled at Ratiſbon in 1802, it was decreed that the biſhopric with its chapter ſhould be ſeculariſed in favour of the duke of Oldenburg: reſerving only the property within the city, which was to be added to the domain of the city. Lubeck was once the chief city of the *Hanſeatic league*, which ſee; but this honour now belongs to Hamburgh. On the ſpot where it now ſtands was formerly a town named "Bucu;" but when this was demoliſhed, about the year 1144, Adolphus II., count of Holſtein and Schauenburg laid the foundation of this city, which, in proceſs of time, became ſo famous. In 1156 the town, which had ſuffered much from fire, was given by count Adolphus to duke Henry, which, being rebuilt, he erected into a free port, and conferred upon it a municipal right of great importance. This was confirmed in 1188, by the emperor Frederick I., and afterwards by ſucceeding emperors. In 1276, the whole city, five houſes excepted, was deſtroyed by fire. Lubeck has various manufactures, and its trade is very conſiderable, partly owing to the commodiouſneſs of its ſituation. The quay of Lubeck is on the river Trave, which falls into the ſea at the diſtance of 14 miles, and admits veſſels from 150 to 200 tons burden, and ſometimes, but rarely, 300. Mr. Coxe obſerved about 120 merchant ſhips deſtined to Ruſſia, Sweden, and Denmark. The trade, however, is chiefly a trade of commiſſion, drawing from Ruſſia, Sweden, and Denmark their raw commodities, and ſupplying them with wines, ſilks, cloth, and ſteel ware. The exports, partly by Lubeck, and partly by Hamburgh, are grain, flax, hemp, hops, wax, honey, cattle, butter, cheeſe, fruits, feathers, dried geeſe, tallow, linſeed, wool, and timber. Lubeck, according to Hoeck, contains 30,000 inhabitants. It was taken by the French in 1806. N. lat. 53° 52′. E. long. 10° 40′.

Lubeck, or *Luboi*, an iſland in the Eaſt Indian ſea, near Madura. Its diſtance W. of Tonikaky is about 112 leagues; and W. from the iſlands of Salembo 31 leagues. S. lat. 5° 43′. E. long. 112° 44′.

LUBEN, a ſmall town of Sileſia, with large ſuburbs, in the principality of Lignitz: here is a Lutheran college; 12 miles N. of Lignitz. N. lat. 51° 22′. E. long. 16° 15′.

LUBENAU, or Lubnow, a town of Lower Luſatia, in the circle of Calau, on a ſmall river which runs into the Spree, the chief place of a barony with a chateau; 15 miles S.S.E. of Lubben. N. lat. 51° 53′. E. long. 13° 52′.

LUBERSAC, a town of France, in the department of the Correze, and chief place of a canton, in the diſtrict of Brives; 8 miles W. of Uzerche. The place contains 3087, and the canton 10,351 inhabitants, on a territory of 247½ kiliometres, in 12 communes.

LUBIEN, a town of the duchy of Warſaw; 26 miles S.S.W. of Poſen.

LUBIENIETZKI, Stanilaus, in *Biography*, a celebrated Unitarian miniſter in the 17th century, was born at Racow in the year 1623. He was educated with great care, and his father introduced him, in due time, to perſons of reſpectability and conſequence in the ſtate. About the year 1648 he was admitted into the miniſtry by the ſynod of Czarcow, and appointed paſtor of a church of that name. This ſituation he was obliged to quit in 1655, upon the irruption of the Swedes into that neighbourhood, and in the following year he retired with his family to Cracow. Here he employed much of his time with the other miniſters, in frequent faſting, prayer, and preaching; and for the benefit of the Hungarian Unitarians, who came thither with prince Ragotſki, he frequently preached in the Latin language. While he continued at Cracow he was much noticed by the king of Sweden, who did him the honour of admitting him to his table. After that city fell again into the hands of the Poles, in 1657, he followed the Swediſh garriſon, with two other Unitarians, to ſupplicate that they and friends of the ſame religious perſuaſion, who had placed themſelves under his protection, might be comprehended in the amneſty to be granted at the concluſion of the peace with Poland. This was not granted, and finding that there was no hope of remaining in ſafety in his native country, he went to Copenhagen, in 1660, to ſeek an aſylum from the king of Denmark for his perſecuted brethren who had been baniſhed from Poland. He received kind treatment from his majeſty, who could do nothing more than promiſe to connive at their ſettlement at Altena. Thus circumſtanced, he thought it adviſable to return to Pomerania, and arrived at Stettin in 1661. Perſecution followed him to this place, and he was obliged to remove to Hamburgh, where he directed his family to join him in the year 1662: from this city he was driven by the ſame fiend in 1667, and took refuge again at Copenhagen. He now hoped there was a proſpect of a peaceful ſettlement, becauſe the magiſtrates of Frederickſburg conſented that the Unitarians ſhould reſide in their town, and enjoy, without moleſtation, the private exerciſe of their religion. He therefore removed to that city, and invited his baniſhed brethren to join him, ſparing no pains nor coſt, that he might ſettle and provide for them there. Scarcely, however, had they taken quiet poſſeſſion of their new abodes, when they were baniſhed from the city, and even the dominions of the prince to whom the city belonged. Lubienietzki was ill at the time when he received the order, but promiſed to obey it as ſpeedily as poſſible. Before, however, he could be removed, poiſon was adminiſtered to him in his food, to which two of his daughters, as well as himſelf, fell ſacrifices, while his wife, who had eaten very ſparingly, narrowly eſcaped the ſame fate. He died in 1675, about the age of fifty-two. He wrote many books, the greater number of which was not printed. The principal publiſhed work was entitled "Theatrum Cometicum," in two vols. folio, which contains a minute hiſtorical account of every ſingle comet which had been ſeen or recorded from the deluge to the year 1665. At the time of his death he was engaged in writing "A Hiſtory of the Reformation in Poland," which was printed in Holland in 1685, in 8vo, with an account of the author's life.

LUBIN, AUGUSTINE, an able geographer in the ſeventeenth century, was born at Paris in the year 1624. He entered, at an early age, among the religious of the reformed order of St. Auguſtine, and was diſtinguiſhed by his proficiency in literary purſuits, particularly in ancient and modern geography, and in ſacred and profane hiſtory. He paſſed through all the offices of his order, and his ſcientific ſkill was rewarded with the poſt of geographer to the king. He died at Paris in 1695. His principal works are "Martyrologium Romanum, cum Tabulis Geographicis et notis Hiſtoricis;" "Tabulæ Sacræ Geographicæ, ſive Notitia Antiqua, medii Temporis, et nova, Nominum utriuſque Teſtamenti ad Geographiam pertinentium;" being a kind of dictionary to all the places mentioned in the bible; "Geographical Tables;" "The Hiſtory of Lapland," tranſlated from Scheffer; "The Geographical Mercury," &c.

LUBIN, EILHARD, was born at Weſterſtede, in the county of Oldenburg, of which place his father was miniſter. He ſtudied at ſeveral German univerſities, and acquired an exact knowledge of the Greek language, with the branches of ſcience uſually taught in thoſe ſeminaries. He was appointed profeſſor of poetry in the univerſity of Roſtock in 1595, and ten years afterwards, was promoted to the profeſſorſhip of divinity. He wrote notes on Anacreon, Juvenal, Perſius, &c. His principal work was entitled "Phoſphorus de Cauſa prima et Natura Mali," printed at Roſtock in 1596. He died in 1621. Bayle.

LUBINIA, in *Botany*, was named by Commerſon, the French botaniſt, in honour of his friend the chevalier de St. Lubin, who diſtinguiſhed himſelf formerly at the ſiege of Madras, and was, it ſeems, in the confidence of Hyder Ally. What pretenſions the chevalier had to commemoration, as a votary of ſcience, does not appear, nor was Commerſon very ſelect in the diſtribution of ſuch honours. Juſſieu, who muſt have ſeen ſpecimens, paſſed over the plant and the name in ſilence. Lamarck referred it to *Lyſimachia*. Venten. Jard. de Celſ. 96.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Lyſimachiæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, in five deep, ovate, rather unequal ſegments, with membranous edges, permanent. *Cor.* of one petal, nearly ſalver-ſhaped, ſlightly irregular; tube funnel-ſhaped, the length of the calyx; limb in five deep obtuſe ſegments, the two lowermoſt rather the ſmalleſt. *Stam.* Filaments five, awl-ſhaped, inſerted into the lower part of the corolla, equal, the length of the tube; anthers erect, oval, two-lobed. *Piſt.* Germen ſuperior, almoſt globular, ſmooth; ſtyle cylindrical, the length of the ſtamens, permanent; ſtigma ſimple, obtuſe. *Peric.* Capſule roundiſh-oval, crowned by the ſtyle, with five notches at the top, of one cell, not burſting. *Seeds* numerous, roundiſh, compreſſed, rough. *Receptacle* central, ovate, ſomewhat compreſſed, unconnected with the capſule except at the baſe, from which it ſeparates as the ſeeds ripen.

Eſſ. Ch. Corolla ſalver-ſhaped, irregular. Capſule ovate, not burſting, crowned with the ſtyle, of one cell. Seeds numerous, attached to a central receeptacle.

1. L. *ſpatulata*. Vent. Jard. de Celſ. t. 96. (Lyſimachia mauritiana; Lamarck Dict. v. 3. 372. Illuſtr. n. 1980.)—The only known ſpecies. Native of the iſle de Bourbon. M. Cels appears to have had it in cultivation. The *root* is ſaid by Ventenat to be biennial, and the *flowers* to be produced in the beginning of ſummer. This *plant* has ſomething of the aſpect of *Convolvulus tricolor*, but is firmer, and quite ſmooth. The woody *ſtem* produces a few ſimple branches, a ſpan long, clothed with numerous, ſcattered, ſpatulate, obtuſe, entire, rather fleſhy *leaves*, above an inch long, tapering down into a bordered footſtalk. *Flowers* axillary, ſolitary, on ſimple ſtalks, half as long as the leaves. *Calyx* dark brown, dotted with black, white at the edge. *Corolla* yellow, nearly as broad as that of *Lyſimachia nemorum*.—Capſule when preſſed burſting irregularly, ſometimes at the ſides, ſometimes, according to Ventenat, into two or four apparent valves. Lamarck ſays it has five valves, but he perhaps judged from the notches at the top. The *fruit* therefore, and the irregular corolla, mark this genus as ſufficiently diſtinct from *Lyſimachia*; to which may be added, on the ſcore of habit, its alternate, not oppoſite or whorled, leaves.

LUBISCHAW, in *Geography*, a town of Pruſſia, in the province of Pomerelia; 18 miles S. of Dantzic.

LUBISCHMAT, a town of Pruſſia, in the palatinate of Culm; 5 miles E. of Thorn.

LUBLENIETZ, or LUBENSKY, a town of Sileſia, in the principality of Oppeln; 29 miles E. of Oppeln. N. lat. 50° 39′. E. long. 18° 42′.

LUBLIN, a city of Poland, and capital of a palatinate of the ſame name; part of which is annexed to the new country of Galicia. It is ſurrounded with a wall and ditch, and though not very large, its caſtle, which is built on a high rock, is ſeated on the river Byſtzrna, in a pleaſant and fertile country. This town contains many churches and convents; and in its ſuburbs are many Jews, who are accommodated with a ſpacious ſynagogue. It has three fairs in the year, one of which laſts a month; and they are frequented by German, Greek, Armenian, Arabian, Ruſſian, Turkiſh, and other traders and merchants. The chief tribunal for Little Poland was formerly held here, together with a provincial diet and a court of judicature. Lublin is diſtant 85 miles S.E. of Warſaw. N. lat. 51° 6′. E. long. 22° 45′.

LUBNEKI, a town of Samogitia; 10 miles N. of Miedniki.

LUBNI, a town of Ruſſia, in the government of Kiev, on the Sula; 8 miles E.S.E. of Kiev. N. lat. 50°. E. long. 32° 54′.

LUBOK, commonly called the *Baviaan*, or *Baboon*, an iſland in the Eaſt Indian ſea, not far from the coaſt of Java, not large, but extremely populous. Seventy or eighty veſſels are continually paſſing to and fro between this iſland and the coaſts of Java and Borneo.

LUBOLO, a province of Angola, in Africa, on the banks of the Coanza.

LUBOMLA, a town of Auſtrian Poland, in Galicia; 32 miles E. of Chelm.

LUBOZ, a town of Lithuania, in the palatinate of Novogrodek; 16 miles N.E. of Novogrodek.

LUBRONG, or Teshoo-Loomboo, a town of Thibet, and reſidence of Teſhoo Lama, capital of that part of the country which is immediately ſubject to his authority, is ſituated in N. lat. 29° 4′ 20″, and E. long 89° 7′. This is a large monaſtery, conſiſting of three or four hundred houſes, the habitations of the Gylongs, beſides temples, mauſoleums, and the palace of the ſovereign pontiff; in which are comprehended alſo the reſidence of the regent, and the dwellings of all the ſubordinate officers, both eccleſiaſtical and civil, belonging to the court. It is included within the hollow face of a high rock, and has a ſouthern aſpect. Its buildings are all of ſtone, none leſs than two ſtories high, flat-roofed, and covered with a parapet, riſing conſiderably above the roof, compoſed of heath and bruſhwood, inſerted between frames of timber, which form a ledge below, and are faſhioned above into a cornice, capped with maſonry. All the houſes have windows; that in the centre projecting beyond the walls, and forming a balcony: they are not cloſed with ſhutters, but black mohair curtains. The principal apartment in the upper ſtory has an opening over it, covered with a moveable ſhed, which ſerves the purpoſe of ſometimes admitting light and air, and in the winter ſeaſon, occaſionally, the grateful warmth of the ſun. Turner's Tibet.

LUBUNGAN, a town on the north coaſt of the iſland of Mindanao.

LUBWACH, a town of Germany, in the biſhopric of Bamberg; 8 miles N.E. of Bamberg.

LUBZ, or Lubitz, a town of the duchy of Mecklenberg; 23 miles S.S.W. of Guſtrow. N. lat. 53° 30′. E. long. 12 .

LUC en Diois, a town of France, in the department of the Drôme, and chief place of a canton, in the diſtrict of Die, ſeated on the Drôme; 9 miles S. of Die.

LUCALA, a town of Africa, in Angola, on a river of the ſame name, which runs into the Coanza; 30 miles N.E. of Maſſangano.

LUCAN, in *Biography*, a celebrated Roman poet, was born at Corduba, in Spain, about the year 39 before the Chriſtian era. His father, Annæus Mela, a Roman knight, was the youngeſt brother of Seneca the philoſopher; and his mother, Acilia, was daughter of Acilius Lucanus, an eminent orator. Lucan was brought to Rome during the firſt months of his infancy, and was committed, at a very early age, to the care of the ableſt maſters in grammar and rhetoric. He ſtudied philoſophy under the ſtoic Cornutus, from whom he derived the lofty and free ſtrain of ſentiment by which he is ſo much diſtinguiſhed. It is ſaid he completed his education at Athens. Seneca, then tutor to the emperor Nero, obtained for him the office of queſtor: he was ſoon after admitted to the college of augurs, and conſidered to be in the full career of honour and opulence. He gave proofs of poetical talents at a very early age, and acquired reputation by ſeveral compoſitions; a circumſtance that excited the jealouſy of the emperor, who valued himſelf on his powers as a poet and muſician. Lucan even ventured to recite one of his own pieces, in competition with Nero; and, to the ſurpriſe of every one, the judges decided in favour of Lucan. From this period Nero regarded the poet with all the malignity of a vanquiſhed rival, and made uſe of his power in forbidding him again to repeat any of his verſes in public. In the conſpiracy againſt the tyrannical emperor, Lucan took a part: the plot was diſcovered, and he was apprehended among the other conſpirators. Tacitus and other authors have accuſed him of the puſillanimity of endeavouring to free himſelf from puniſhment, by accuſing his own mother, and involving her in the crime of which he was guilty. Mr. Hayley has endeavoured to reſcue his name from ſo terrible a charge, by obſerving and commenting on the fact, that the mother of Lucan was paſſed over without puniſhment: hence he inferred, that no evidence exiſted of her having been charged by her ſon, but popular rumour; becauſe it is well known that no other perſon, however diſtantly implicated in the conſpiracy, eſcaped without ſome kind of penalty. At any rate, his confeſſions were of no avail, and his mind recovered its firmneſs for the concluding ſcene. No favour was granted him but the choice of the death he would die; and he choſe the ſame which had terminated the life of his uncle Seneca. His veins were accordingly opened; and when he found himſelf growing cold and faint through loſs of blood, he repeated ſome of his own lines, deſcribing a wounded ſoldier ſinking in a ſimilar manner: theſe were the laſt words which he uttered. He died in the year 65, and in the 27th year of his age. Of the various poems of Lucan, none but his Pharſalia remain, which is an account of the civil wars between Cæſar and Pompey, but is come down to us in an unfiniſhed ſtate. Its title to the name of an epic poem has been diſputed by thoſe critics, who, from the examples of Homer and Virgil, have maintained that machinery, or the intervention of ſupernatural agency, is eſſential to that ſpecies of compoſition. As to the merits of the poetry itſelf there are various opinions. Lucan certainly poſſeſſes neither the fire of Homer, nor the melodious numbers of Virgil. If he had lived to a maturer age, his judgment as well as his genius would have been improved, and he might have claimed a more exalted rank among the poets of the Auguſtan age. His expreſſions, however, are bold and animated; his poetry entertaining; and it has been aſſerted that he was never peruſed without the warmeſt emotions, by any whoſe minds were in uniſon with his own. The beſt edition of the Pharſalia is the Variorum, Leyd. B. 8vo., 1669. The editions by Oudendorp, 1728; by Burman, 1740; by Bentley, 1760; and by Barbou, 1767, are in good eſteem. The Pharſalia has been tranſlated into Engliſh verſe by Mr. Nicholas Rowe. There was no Delphin edition of this poem, devoted to the intereſts of liberty; but it was one of the firſt pieces of ancient literature that was publiſhed during the French republic, by Didot, in a ſplendid folio.

Lucan, in *Geography*, a village of the county of Dublin, Ireland, pleaſantly ſituated on the banks of the Liffey. It is remarkable for a ſulphureous medicinal ſpring, which is much frequented. It is 6½ miles W. from Dublin.

Lucan, *Al*, a town of Aſiatic Turkey, in Aladulia; 15 miles E. of Maraſch.

LUCANAS, a juriſdiction of the dioceſe of Guamanga, in the viceroyalty of Peru, commencing about 25 or 30 leagues S.W. of Guamanga. Its temperature is cool and moderate. The parts of the former breed large droves of all ſorts of cattle; and thoſe of the latter are fertile in grain, herbs, and fruits. It alſo abounds in valuable ſilver mines, in which the riches of Peru chiefly conſiſt; and by theſe means it becomes the centre of a very extenſive commerce; great numbers of merchants reſorting hither with their goods, and others for purchaſing ſuch proviſions as their own reſpective countries do not afford, for which they give in exchange ingots and pinnas of ſilver.

LUCANIA, in *Ancient Geography*, a province of Italy, bounded on the north by Campania and Apulia, on the eaſt by Sinus Tarentinus, on the ſouth by Brutium, and on the weſt by the Tuſcan ſea. A ridge of the Apennines, running from north to ſouth, divides this province into two parts.

LUCANUS, in *Natural Hiſtory*, a genus of inſects of the order coleoptera: antennæ clavate, the club compreſſed and divided into ſhort pectinate leaves; jaws projecting beyond the head, ſo as to reſemble horns, toothed; two palpigerous tufts under the lip.

This genus differs chiefly from the Scarabæus, (to which the reader is referred,) in having the jaws conſiderably elongated, ſo as to give the appearance of a pair of denticulated horns; while the antennæ terminate in a laterally flattened tip, divided on the interior ſide into ſeveral lamellæ. There are twenty-ſix ſpecies, of which four are Britiſh, which will be noticed by aſteriſks.

Species.

Alces. Jaws exſerted, four-toothed at the tip. It inhabits ſeveral parts of Aſia. The head is large, depreſſed, black, ſinuate on each ſide; jaws longer than the head, compreſſed at the tip, and armed with a ſtrong tooth in the middle within.

Giraffa. Jaws exſerted, depreſſed, with many different ſized teeth; lip rounded. Inhabits Aſia. The jaws are likewiſe very long; the teeth at both ends larger; thorax with an unequal margin; body black.

* Cervus; Stag-beetle, or ſtag-chaffer. Jaws exſerted, forked at the tip; a ſmall branch near the middle within. It is the largeſt of all the European coleopterous inſects, ſometimes meaſuring nearly two inches and a half in length, from the tip of the jaws to the end of the body. Its general colour is a deep cheſnut, with the thorax and head, which is of a ſquariſh form, of a blacker caſt; and the jaws are often of a brighter or redder cheſnut colour than the wing-ſhells; the legs and under-parts are coal-black; and the wings which, except during flight, are concealed under the ſhells, are large, and of a fine pale yellowiſh-brown. This remarkable inſect is chiefly found in the neighbourhood of oak-trees, delighting in the ſweet exſudation, or honey-dew, ſo frequently obſerved on the leaves. Its larva, which perfectly reſembles that of the genuine beetles, is alſo found in the hollows of oak-trees; reſiding in the fine vegetable mould uſually ſeen in ſuch cavities, and feeding on the ſofter parts of the decayed wood. It is of a very conſiderable ſize, of a pale yellowiſh or whitiſh-brown colour; and when ſtretched out at full length, meaſures nearly four inches. It has been ſuppoſed by Roeſel, that theſe *larvæ* were the *coſſi* of the ancient Romans, which, according to Pliny, were in high eſteem as an article of luxury. What renders this ſuppoſition the more probable is, that the larvæ of a ſpecies of cerambyx, as well as of a curculio, are well known to be greatly admired by the inhabitants of the Weſt Indian iſlands, and are frequently collected at a great expence, as a highly delicate diſh, being broiled or fried for that purpoſe. When arrived at its full ſize, which, according to ſome, is hardly ſooner than the fifth or ſixth year, it forms, by frequently turning itſelf, and moiſtening it with its glutinous ſaliva, a ſmooth oval hollow in the earth, in which it lies; and afterwards remaining perfectly ſtill for the ſpace of nearly a month, diveſts itſelf of its ſkin, and commences pupa or chryſalis. It is now of a ſhorter form than before, of a rather deeper colour, and exhibits, in a ſtriking manner, the rudiments of the large extended jaws and broad head, ſo conſpicuous in the perfect inſect: the legs are alſo proportionably larger and longer than in the larva ſtate. The ball of earth, in which this chryſalis is contained, is conſiderably larger than a hen's egg, and of a rough exterior ſurface, but perfectly ſmooth and poliſhed within. The chryſalis lies about three months before it gives birth to the complete inſect, which uſually emerges in the months of July and Auguſt. The time, however, of this inſect's growth and appearance in all its ſtates varies much, according to the difference of ſeaſons. It is not very uncommon in many parts of England.

The commonly ſuppoſed female differs ſo much in appearance from the male, that it has by ſome authors been conſidered as a diſtinct ſpecies. It is not only ſmaller than the former, but totally deſtitute of the long and large ramified jaws; inſtead of which it has a pair of very ſhort curved ones, ſlightly denticulated on their inner ſide: the head is alſo of conſiderably ſmaller diameter than the thorax. In point of colour it reſembles the former. Among thoſe who conſider it as a diſtinct ſpecies may be numbered the ingenious Mr. Marſham, F.L.S., who, in his "Entomologia Britannica," aſſures us that the real female inſect extremely reſembles the male, but is ſmaller, and wants the larger denticulation on the inner ſide of each horn. The generally ſuppoſed female he diſtinguiſhes by the title of "Lucanus inermis."

Saiga. Jaws exſerted, many-toothed; lip abbreviated, emarginate. Inhabits America. Body depreſſed, ſmooth, black; jaws hardly forked at the end.

Elaphus. Jaws exſerted, one-toothed, forked at the tip; lip deflected, conic; hind margin of the head much elevated, emarginate. Female leſs; the jaws not exſerted. Inhabits Virginia.

Capreolus. Jaws exſerted, the middle denticles differently ſhaped, forked at the tip. Inhabits Germany. It is about half the ſize of the cervus above deſcribed; jaws with two thick approximate lobed denticles in the middle; body black.

Dama. Jaws exſerted, two-toothed within, as long as the head. Inhabits Virginia. A variety has jaws entire at the end; thighs ferruginous.

Femoratus. Jaws exſerted, three-toothed; body black; thighs ferruginous. It inhabits Cayenne. The head is plain, almoſt without lip; thorax more duſky; the fore margin fulvous, ciliate; the hind margin two-toothed each ſide; ſcutel fulvous, ſilky.

Bison. Jaws exſerted, many-toothed; thorax and ſhells edged with red. Inhabits America. Edge of the thorax rufous, with a black line.

Gazella. Jaws two-toothed within; body black; ſhells edged with teſtaceous. Inhabits Siam. The jaws are ſhort; head with a ſmall plate before the eyes; hind edge of the thorax notched on each ſide; ſhanks angular, grooved.

Lama. Jaws exſerted, three-toothed, ſhorter than the head; thorax angular. Inhabits India.

Suturalis. Jaws exſerted, three-toothed at the baſe within; body teſtaceous, with a dorſal black line; the head is teſtaceous, with a black margin and dorſal line, which is bifid at the tip; thorax teſtaceous, with a black dorſal line and ſpot each ſide at the baſe.

Carinatus. Depreſſed; thorax unarmed, ſhorter than the head, the hinder angles excavated; abdomen very ſhort; breaſt ending behind in an acute angle. Inhabits India.

* Parallellepipedus. Jaws with a lateral elevated tooth within; body depreſſed. It inhabits Europe. Body black, very ſmall: female with a double prominent dot on the head.

Tenebroides. Jaws lunate, one-toothed; body black; thorax margined; ſhells ſubſtriate. Inhabits Ruſſia. Abdomen pitchy.

Cacuroides. Jaws incurved, with a thick differently ſhaped tooth within; ſhells punctured, ſlightly downy; thorax a little grooved; ſhanks ſerrate. It inhabits Van Diemen's land.

* Caraboides. Blueiſh; jaws lunate; thorax margined: varies in being greeniſh, with reddiſh legs and abdomen. Inhabits Europe.

Piceus. Black, ſmooth, ſtriate; antennæ, abdomen, and legs pitchy. Inhabits Sweden.

Capensis. Exſcutellate, black; body depreſſed; thorax ſtriate. Found in Chili, South America.

Pilmus. Exſcutellate, black; ſhells with punctured grooves. Inhabits the Cape.

Tarandus. Scutellate, black, very ſmooth; jaws exſerted, three-toothed at the tip, two-toothed on the inner ſide. Inhabits Africa.

Antilope. Jaws exſerted, edged on the inner ſide, the upper margin two-toothed, but the lower five-toothed; body brown, nearly ſmooth. Found in different parts of Africa.

Bubalus. Black; jaws bifid; one part projecting, ſublunate, three-toothed within; the other larger, deflected, arched entire. Inhabits Georgia.

Interruptus. Antennæ arched; body black, with a recumbent ſpine on the crown; thorax and abdomen remote; thorax and ſhells ciliate, with rufous. Inhabits America and the Weſt India iſlands, under rotten ſugar-canes. This is the paſſalus interruptus of Fabricius.

Dentatus. Antennæ arched; head many-toothed; thorax punctured at the ſides; thorax and abdomen remote. Found in the iſland of Guadaloupe. This is the paſſalus dentatus of Fabricius.

Minutus. Antennæ arched; thorax and abdomen remote, ferruginous; ſhells teſtaceous. This is the paſſalus minutus of Fabricius, and is found in the South American iſlands. The body is much depreſſed, hardly larger than a louſe; jaws exſerted, ſhort, unarmed, pointed; ſhells hardly ſtriate.

Dr. Shaw mentions a highly elegant ſpecies, that has lately been diſcovered in New Holland, which differs from the reſt in being entirely of a beautiful golden green colour, with ſhort, ſharp-pointed, denticulated jaws of a brilliant copper colour. The whole length of the inſect is rather more than an inch. Gmelin's Linn. Shaw's Zoology. Donovan.

LUCAR, among the Romans, an appellation given to the money expended upon plays and public ſhows.

Lucar *de Barrameda, St.*, in *Geography*, a decayed ſea-port town of Spain, in the province of Seville, at the mouth of the Guadalquivir, the key of Seville, with a good harbour, but difficult of acceſs on account of a rock in the water. A whole fleet may lie ſecurely in the road. The chief article of its trade is ſalt; 13 miles N. of Cadiz. N. lat. 36° 45′. W. long. 6° 27′.

Lucar *de Guadiana, St.*, a town of Spain, in the province of Seville, ſituated on the Guadiana, on the confines of Portugal, and defended by towers and baſtions. The tide flows up to the town, ſo as to bring ſmall veſſels into its harbour; 64 miles W. of Seville. N. lat. 37° 30′. W. long. 7° 25′.

Lucar *le Mayor, St.*, a town of Spain, in the province of Seville, on the Guadiamur; 10 miles W. of Seville.

LUCARIA, an ancient feaſt celebrated by the Romans. Sext. Pompeius obſerves, that the lucaria were ſolemnized in the woods, where the Romans, defeated and purſued by the Gauls, retired, and concealed themſelves. The word, according to Feſtus and Sext. Pompeius, comes from *lucus*, *a grove* or *wood*. Varro derives it from *luce*, the ablative of the word *lux*, *light* and *liberty*. But the former etymology ſeems the more natural.

It was held in the month of July, in memory of the aſylum they found in the wood, which was between the Tyber and the road called Via Salaria.

LUCAS, Tudensis, in *Biography*, a Spaniſh writer and prelate, who flouriſhed in the thirteenth century, was firſt a deacon in the church, and afterwards biſhop of Tuy, a city of Gallicia, whence he has his ſurname. He travelled into ſeveral parts of the eaſt and other countries, for the purpoſe of obtaining information concerning the religion and ceremonies of different nations; and was raiſed to his biſhopric by pope Gregory IX. His principal work was "A Treatiſe againſt the Albigenſes." He was author, likewiſe, of "The Life of St. Iſidore of Seville;" and he made conſiderable additions to "The Chronicle of St. Iſidore." Gen. Biog.

Lucas, Francis, a learned divine, who flouriſhed in the ſeventeenth century, was a native of Bruges, was educated at Louvain, attained to the degree of doctor, and was made dean of the church of St. Omer's. He died in 1619. He was profoundly ſkilled in the Greek, and in all the oriental languages; and was an expert judicious critic. He was the author of "Notationes in ſacra Biblia, quibus variantia diſcrepantibus Loca, Exemplaribus ſummo Studio diſcutiuntur," 4to., 1580; "Commentaria in Evangel." in 5 vols., folio; "Notæ ad varias Lectiones in Evangel.;" "Concordantiæ Latinorum Bibliorum Vulgatæ Editionis," and of many other learned works.

Lucas, Paul, a celebrated traveller, was born at Rouen in 1664. He felt an early inclination to travel into foreign countries, which he gratified by ſeveral tours through the Levant, Egypt, Turkey, and other parts. He brought back a rich treaſure of medals and other curioſities for the king's cabinet, who ordered him to draw up an account of his travels, and who, in 1714, nominated him one of his antiquaries. He was afterwards employed by the ducheſs of Burgundy. In 1723 he took another voyage to the Levant, by order of Lewis XV., and collected many curious and valuable manuſcripts and medals. From this period to 1736 he lived a life of repoſe; but in the laſt named year he viſited Spain, a country which he had never before ſeen, and was well received by the king, who engaged him to arrange his cabinet of medals: but during this employment he was taken ill, and died in 1737, at the age of ſeventy-two. He was author of a work, entitled, "Travels of Paul Lucas," in ſeven volumes. In four of them is an account of his voyage to the Levant, to Greece, Aſia Minor, Macedonia, and Africa. His travels in Turkey, Aſia, Syria, Paleſtine, and Egypt, were publiſhed at Rouen, in three volumes.

Lucas, Richard, a native of Wales, was born at Preſteigne, in Radnorſhire, in the year 1648; and when he had laid a good foundation in grammar learning, he was ſent to the univerſity of Oxford, and entered a ſtudent at Jeſus college in 1664. He took his degree of arts in 1668, and in 1672; and was ſome time maſter of the free-ſchool at Abergavenny, in Monmouthſhire. From this place he removed to London, and obtained the vicarage of St. Stephen's, Coleman-ſtreet, and became lecturer of St. Olaves, Southwark, in 1683. In 1691 he took his degree of doctor of divinity, and was inſtalled prebendary of Weſtminſter in 1696. Soon after this, an infirmity which he had experienced in his eyes, from his youth, deprived him totally of his ſight. He died in 1715, at the age of ſixty-ſeven, and was buried in Weſtminſter Abbey. He was highly valued by his contemporaries for his piety and learning; and his writings have tranſmitted his name with honour to poſterity. Of theſe the moſt important is his "Inquiry after Happineſs," in two volumes, 8vo., which has gone through many editions. It is remarkable that it was compoſed by the author, after he had loſt his ſight, and was rendered incapable of public ſervices. His other works are "Practical Chriſtianity," and "The Morality of the Goſpel;" "A Guide to Heaven;" "Five Volumes of Sermons," and ſome ſmaller pieces. He tranſlated into the Latin language "The whole Duty of Man," which was printed in 1680. Biog. Brit.

Lucas, *St.*, in *Geography*, a town of Mexico, in the province of Guatimala; 12 miles E. of Guatimala.—Alſo, a ſmall iſland near the coaſt of Mexico, in Salinas bay. N. lat. 10° 15'. W. long. 85° 22'.

LUCAU, or Lucca, in *Geography*, a town of Saxony, in the principality of Altenburg; 8 miles N.N.W. of Altenburg. N. lat. 51° 6'. E. long. 12° 18.—Alſo, a town of the duchy of Carinthia, near the Geil; 32 miles E. of Brixen.

LUCAYA Islands. See Bahama.

LUCAYO, one of the Bahama iſlands; 20 miles long, and five broad. N. lat. 27° 25°. W. long. 78°.

LUCAYONEQUE, one of the Bahama iſlands; 75 miles long, and five or ſix broad, but of an irregular form. N. lat. 27°. W. long 77° 30'.

LUCCA, a ſmall republic of Italy, on the coaſt of the Tuſcan ſea, in N. lat. 43° 50'. It is bounded N. by the late duchy of Modena; on the S.W. by the Mediterranean; and every where elſe by Etruria. It is computed to be upwards of 35 miles in length, and from 15 to 20 in breadth, and to contain 288 ſquare miles, and within its extent one city, 150 villages, and 120,000 inhabitants, of whom, it is ſaid, that from 20,000 to 30,000 are able, on occaſion, to bear arms. The Luccaneſe are the moſt induſtrious people of Italy, and no ſpot of ground is left uncultivated; the hills being covered with vines, olives, cheſnut, and mulberry trees, while the meadows near the coaſt nouriſh numerous cattle; but the country does not produce corn ſufficient for the conſumption of its inhabitants. Oil and ſilk are the chief exports of Lucca, and their motto is Libertas, a goddeſs, rarely found more amiable than here. Lucca was anciently a Roman colony; when the Lombards overran Italy, it became tributary to them; afterwards it was annexed to the dominion of the Franks, and from them the emperors of Germany claimed its ſovereignty. In the reign of Charles IV. it became an independent ſtate, and has, during three centuries, maintained its liberty, under the protection of ſome foreign power. In the recent revolutions of Italy, this ſtate adopted a conſtitution ſimilar to the French; and it is now a principality, with the addition of Maſſa Carrara, and Garfagnana.

Lucca, the capital of the fore-mentioned principality, and the reſidence of the government, is delightfully ſituated in a plain, terminated by eminences, and diverſified with villages, ſeats, ſummer-houſes, vineyards, meadows, and cornfields. This city is regularly fortified with eleven baſtions; its circuit is about a league; it is well-built, and the ſtreets, though irregular, are broad and well paved. Situated near the river Serchio, 12 miles N.E. of Piſa, it contains a ſtate-palace, within which is a large arſenal, a Gothic cathedral, with a richly furniſhed chapel, 25 churches, 40 convents, and about 40,000 inhabitants; among whom are many artiſts and manufacturers, eſpecially in ſilk and gold, and ſilver ſtuffs. The biſhop holds immediately of the pope, and is entitled to the pallium, or crucifix, as an archbiſhop. In the cathedral is a volo ſanto, or wooden crucifix, to which a peculiar veneration is paid. In the year 1799, the French entered this city, and impoſed upon it a contribution of 2,000,000 livres. They ſeem to have taken it under their protection, and to allow it its freedom. N. lat. 43° 54'. E. long. 10° 34'.

Lucca, a river of Aſia, which riſes in Perſia, and runs into the Indus, about 18 miles above the conflux with the Chunaub.

LUCCHESI, Andrea, in *Biography*, a native of Venice, and maeſtro di cappella, in 1772, to the elector of Cologne. A pleaſing compoſer, whoſe motets were frequently ſung by Manſoli, and other great ſingers in the churches of Italy, and whoſe ſymphonies were much eſteemed, even in Germany, where they have been brought to the greateſt perfection. In 1767, he compoſed a cantata for a grand feſtival given to the duke of Wirtemburg at Venice.

LUCCI, in *Geography*, a town of Naples, in Calabria Citra; 3 miles S. of Biſignano.

LUCCOS, a river of Morocco, anciently called *Lixos*, which runs into the Atlantic at Laracha.

LUCE, St., a cluſter of ſmall iſlands in the Indian ſea, near the eaſt coaſt of Madagaſcar. S. lat. 24° 30'. E. long. 47° 40'.

Luce, *Eau de.* See Eau *de Luce.*

LUCEA, in *Geography*, a bay or harbour, on the N. ſide of the iſland of Jamaica, into which run two rivers, called Eaſt and Weſt Lucea; 14 miles W. of Montego bay. N. lat 18° 28'. W. long. 78° 9'.

LUCENA, a town of Spain, in the province of Cordova, in which are ten convents; 29 miles S.S.E. of Cordova. N. lat. 37° 32'. W. long. 4° 29'.—Alſo, a town of Spain, in Valencia; 18 miles N.E. of Segorbe.

LUCENAY l'Eveque, a town of France, in the department of the Saône and Loire, and chief place of a canton, in the diſtrict of Autun; 7 miles N. of Autun. The place contains 804, and the canton 9168 inhabitants, on a territory of 250 kiliometres, in 12 communes. N. lat. 47° 5'. E. long. 4° 20'.

LUCERA, an ancient, inconſiderable, manufacturing town of Naples, capital of the province of Capitanata, and ſee of a biſhop, ſuffragan of Benevento; containing four churches and nine monaſteries, and pleaſantly ſituated on an eminence in a plain, near the middle of the province, about 75 miles N.E. of Naples. The juriſdiction of the province is held here, and the manufacture is cloth. N. lat. 41° 28'. E. long. 15° 16'.—Alſo, a town of Naples, in Calabria Citra; 7 miles S. of Coſenza.

LUCERIUS, in *Mythology*, a name given to Jupiter, as *Luceria* was given to Juno, as the deities which gave light to the world.

LUCERN, in *Geography*, a canton of Switzerland, bounded on the W. and N. by Bern, on the E. by Zurich and Schweitz, on the S. by Underwalden and Bern, lying in N. lat. 47° 10'; being from 30 to 50 miles from N. to S., and from 25 to 30 in breadth, and containing 100,000 inhabitants, who are chiefly employed in agriculture. The ſouthern parts of this canton are chiefly mountainous, and furniſh for exportation cattle, hides, cheeſe, and butter. The northern diſtrict is fruitful in corn, which, being more than ſufficient for the conſumption of the canton, allows of a conſtant exportation from the weekly market held in the town, to which the inhabitants of the ſmall canton reſort for the purchaſe of that and of other neceſſaries. This commerce, together with the paſſage of the merchandize for Italy, is the chief ſupport of the town, and might be much improved and augmented, conſidering its advantageous ſituation; for the Reuſs iſſues from the lake, paſſes through the town, and, having joined the Aar, falls into the Rhine.

Lucern, originally ſubject to the houſe of Auſtria, was expoſed to the inroads of Uri, Schweitz, and Underwalden, when theſe cantons had ſeized their independence. Her commerce to Italy was interrupted; her fairs unfrequented; and her citizens compelled to be continually under arms, in order to protect their territory from inceſſant depredations. Under theſe circumſtances, the Auſtrians loading the citizens with exorbitant taxes, Lucern made her peace with the confederate cantons; and, expelling the Auſtrian party, entered into a perpetual alliance with Uri, Schweitz, and Underwalden, and became a member of the Helvetic union. The acceſſion of Lucern gave additional credit and power to the confederacy, and enabled it to reſiſt all the efforts of a great and implacable enemy. In 1386, Leopold, duke of Auſtria, invaded the canton with a numerous army; when the combined troops gained a bloody victory at Sempach, in which Leopold loſt his life.

The government of Lucern was entirely ariſtocratical, or rather oligarchical. The ſovereign power reſided in the council of 100, compriſing the ſenate, or little council. The great council was the nominal ſovereign; but the whole power actually reſided in the ſenate, conſiſting of 36 members, who were formed into two diviſions, exerciſing the office by rotation. The adminiſtration of the current affairs, the care of the police, the management of the finances, and the whole executive power, reſided in the ſenate, which ſat conſtantly; whereas the ſovereign council was aſſembled only upon important occaſions. The ſenate had cognizance of criminal cauſes; but in caſe of capital condemnation the ſovereign council was convoked, in order to pronounce the ſentence. In civil cauſes, an appeal lay from the ſenate to the ſovereign council, which, in reality, was a matter of mere form, as it was an appeal from the ſenators in one court, to the ſame ſenators in another. The influence of the ſenate over the ſovereign council was abſolute; for they conſtituted above a third of that body, choſe their own members, conferred the principal charges of government, and nominated to the eccleſiaſtical benefices, which are conſiderable; nearly two-thirds of the revenue of the canton belonging to the clergy. From a view of this conſtitution, it appears, that when the ſpirit of the conſtitution is oligarchical, all laws enacted for the purpoſe of counteracting the power of the nobles are mere cyphers. However, in ſome inſtances, the authority of the nobles is controuled; for, in declaring war and peace, forming new alliances, or impoſing taxes, the citizens were to be aſſembled, and to give their conſent. Lucern, being the firſt in rank and power among the Catholic cantons, was the reſidence of the pope's nuncio, and all affairs relating to religion were diſcuſſed in the annual diet, which aſſembled in the town, and which was compoſed of the deputies of thoſe cantons.

Lucern, though an oligarchical ſtate, manifeſted, at the time of the French revolution, an averſion from all innovation. The people appeared to be ſatisfied with their government, and reſiſted all attempts to effect a change. During the progreſs of the revolution, Lucern acted with great ſpirit, and was inclined to join in defence of her own independence, as well as in ſupport of the Helvetic union. Even after the ſurrender of Bern and the deſertion of Zurich, a numerous body of peaſants demanded the re-eſtabliſhment of the ancient government, and joined the troops of the ſmall cantons to reſiſt the entrance of the French; and the whole canton did not acquieſce without much oppoſition and bloodſhed. At length a corps of French, after a ſhort inveſtment, entered the town of Lucern, and reduced the people to unconditional ſubmiſſion. Soon after this event, Lucern became the ſeat of the new Helvetic government. According to the conſtitution of the 29th of May, 1801, Lucern was one of the 17 departments, or cantons, into which Switzerland was divided: it retained its former extent and deputed five repreſentatives to the diet. Near the town of Lucern is mount "Pilate," formerly called Mons *Pileatus*, from the Latin word *pilea*, becauſe its top is generally covered with a cloud or cap. This word has been corrupted into "Pilatus," whence ſome have ridiculouſly contended that Pontius Pilate, after having condemned our Saviour to death, was ſeized with remorſe, made an excurſion into Switzerland, and drowned himſelf in a lake at the top of the mountain. At the elevation of 5000 feet, and in the moſt perpendicular part of this mountain, near the paſture of Brunlen, is obſerved, in the middle of a cavern hollowed in a black rock, a coloſſal ſtatue, which appears to be of white ſtone. It is the figure of a man in drapery, leaning one elbow on a pedeſtal, with one leg croſſed over the other, and ſo regularly formed, that it can ſcarcely be a luſus naturæ. This ſtatue is called "Dominic" by the peaſants, who frequently accoſt it from the only place in which it can be ſeen, and when their voices are re-echoed from the cavern, they ſay, in the ſimplicity of their hearts, "Dominic has anſwered us." It is difficult to imagine by whom, or in what manner, this ſtatue could be placed in a ſituation which has hitherto proved inacceſſible to all who have endeavoured to approach it. This is, perhaps, one of the higheſt mountains in Switzerland, if eſtimated from its baſe, and not from the level of the ſea; its elevation above the lake being more than 6000 feet. Soon after the French took poſſeſſion of Lucern, general Brune erected, with great ſolemnity, the ſtandard of liberty on the top of mount Pilate; thus, as Coxe ſays, conferring on the Swiſs the ſhadow, while he deprived them of the ſubſtance of freedom. Coxe's Switzerland, vol. i.

LUCERN, the capital of the above-deſcribed canton, a ſmall, tolerably built, walled, trading town, containing about 3300 inhabitants, and agreeably ſituated on a plain almoſt environed by hills, at the efflux of the Reuſs from the lake of Lucern, and at the N.W. extremity of the lake; 30 miles S.W. of Zurich, and 40 E. of Bern. The cathedral and Jeſuits' church are the only public buildings worthy of notice; but they are overloaded with rich ornaments, and diſgraced by bad paintings. In the cathedral is an organ of fine tone, and extraordinary ſize; the centre pipe is 40 feet long, near three in diameter, and weighs 1100 pounds. The bridges which ſkirt the town, round the edge of the lake, are the faſhionable walks of the place, and remarkable for their length; being covered at the top, and open at the ſides, they afford a conſtant view of the delightful and romantic country; they are decorated with coarſe paintings, repreſenting the hiſtories of the Old Teſtament, the battles of the Swiſs, and the dance of Death. In the Waſſerthurm tower, the treaſure of the republic is depoſited. The arſenal is well furniſhed with arms. This place is a thoroughfare from Italy by mount St. Gothard; but it has no manufactures of conſequence, and little commerce. Of late the principles of toleration have been better underſtood and more widely diffuſed than they were formerly, and a literary ſociety has been eſtabliſhed for the promotion of polite learning. The lake is bounded towards the town of Lucern by cultivated hills ſloping gradually to the water, contraſted on the oppoſite ſide by an enormous maſs of barren and craggy rocks. N. lat. 46° 56′. E. long. 8° 6′. See the preceding article.

Lucern, *Lake of*, called the Waldſtætter ſee, or lake of the four cantons, conſiſts of ſeveral branches and gulfs, diſtinguiſhed by particular names, and affording variety of fine ſcenery. See Lake.

Lucern, in *Botany*. See Medicago.

Lucern, in *Agriculture*, a plant of the artificial graſs kind, chiefly cultivated as a green food for cattle, and which affords a larger produce than moſt other ſorts in proportion to the extent of land. It is known among botaniſts by the name of *medicago ſativa*, and is the *alſaſa* of the Spaniards, and the *grand treſle* of the French. It has a perennial root, and an annual ſtalk, which riſes full three feet high in good land, and is furniſhed at each point with trifoliate leaves, the lobes of which are ſpear-ſhaped, about an inch and a half long, and half an inch broad, ſawed towards the ſtalks. The flowers grow in ſpikes, which are from two to near three inches in length, ſtanding upon naked footſtalks two inches long, riſing from the wings of the ſtalks: they are of the pea-bloom, or butterfly kind, of a fine purple colour, and are ſucceeded by compreſſed moon-ſhaped pods, which contain ſeveral kidney-ſhaped ſeeds. It flowers in June, and its ſeed ripens in September.

There are ſeveral varieties of lucern, as thoſe with violet-coloured flowers, with yellow flowers, with yellow and violet flowers mixed, and with variegated flowers: but the editor of Mr. Miller's Dictionary obſerves, that they are only variations of the ſame plant, ariſing accidentally from the ſeed. However, neither the yellow nor the variegated flowered lucern is ever ſo ſtrong as that with purple flowers; and cannot of courſe be ſo profitable to the cultivator.

It may be remarked, that Columella eſteemed this plant as the choiceſt of all fodder, becauſe it laſted many years, and bore being cut down four, five, or ſix times a year. In his opinion it enriched the land on which it grew, fattened the cattle fed with it, and was often a remedy for ſick cattle. About three-quarters of an acre of it is, it is ſuppoſed, abundantly ſufficient to feed three horſes during the whole year. But though it was ſo much eſteemed by the ancients, and has been long cultivated to advantage in France and Switzerland, it has yet found no great reception in this country, though it will ſucceed here as well as in either of the above countries, being extremely hardy, and capable of reſiſting the cold of our climate.

In the Synopſis of Huſbandry, it is noticed, that it is not till within theſe thirty years that this graſs has been much in repute with the farmer, though it was known in England long before that time: but the cultivation of it was chiefly confined to gentlemen who raiſed it on their own demeſnes; for the huſbandmen, being well convinced of the extraordinary care required to prepare the land for the growth of it, were deterred from embarking in a buſineſs which ſeemed to be attended with much expence, and contented themſelves with raiſing green fodder from their tares and clover, leaving the cultivation of this uſeful graſs to their landlords, who could better ſpare the money for that purpoſe. But now that its virtues are better known, and the method of raiſing it more perfectly underſtood, there are few farmers, who do not chooſe to ſow ſome acres of it, to ſupply their horſes with a wholeſome and laſting feed throughout the ſummer. The ſeed is of a paler caſt than that of clover, and rather larger in ſize. It is annually provided from Holland by the ſeedſmen, and ſold at different prices, from one to two ſhillings or more *per* pound, according to circumſtances.

Soil.—In reſpect to the ſoils that are moſt ſuitable to the culture of this plant, they are all thoſe of the more deep, rich, and dry kinds, as thoſe of the ſound, mellow, loamy, and ſandy deſcriptions; but on ſuch as are retentive of moiſture, it ſhould not be attempted, as the roots of the plants are liable to be greatly injured, if not wholly deſtroyed, by the ſtagnation of water about them. Weeping gravelly lands, and all ſuch as are not well drained, are of courſe improper for this ſort of culture. Mr. Young ſuggeſts, that "the ſoils that ſuit lucern, are all thoſe that are at once dry and rich. If they poſſeſs theſe two criteria, there is no fear but they will produce large crops of lucern. A friable deep ſandy loam or chalk, or white dry marly bottom, is excellent for it. Deep putrid ſands, warp on a dry baſis, good ſandy loam on chalk, dry marle or gravel, all do well: and, in a word, all ſoils that are good enough for wheat, and dry enough for turnips to be fed on the land, do well for lucern. If deficient in fertility, they may be made up by manuring, but he never yet met with any land too rich for it."

Preparation.—The author of the Syſtem of Agriculture remarks, that "in the preparation of the land, the ſoil ſhould be always brought into as fine a condition of mould as poſſible. This may be effected by repeated ploughing and harrowing, and the previous growth of ſuch ſorts of crops of the green kind as have a tendency to clean and render the land more fine and mellow." In this intention Mr. Young adviſes the taking of two crops of turnips, carrots, or cabbages, either in ſucceſſion, or alternating with each other, the turnips in the heavier loams being eaten off upon the land in the ſecond autumn before it is ploughed up. In either of theſe caſes, from the hoeing and conſtant culture which is neceſſary while the crops are upon the land, it will be left in a ſuitable ſtate of cleanneſs and friability. "Others recommend fallowing as a better practice, the root weeds of every kind being carefully picked out in the different ploughings and harrowings. From the great length of time the ground muſt remain unemployed in this mode of preparation, it is probably only capable of being practiſed with advantage where the lands are heavy and very full of weeds." But whatever mode is employed, the land muſt be rendered perfectly clean before this ſort of crop is ventured upon it.

And it is requiſite, that before the ſeed is put in, the mould ſhould be rendered perfectly fine by ploughing it over as frequently as may be neceſſary, and breaking it well down by occaſional harrowing. It will ſeldom be neceſſary to make uſe of manure; but where the land is found to ſtand in need of it, the application is beſt made with the firſt of the green crops. The object to be conſtantly kept in view in this buſineſs, is chiefly that of rendering the land perfectly clean from weeds, and at the ſame time highly mellow and friable.

Nature and Quantity of Seed.—As ſeedſmen are apt to keep their ſeeds from year to year, it may be neceſſary to appriſe the farmer, that that which is perfectly freſh, is the moſt proper for being ſown, as moſt ſmall ſeeds vegetate in the moſt perfect manner when new.

And with reſpect to the quantity of ſeed, Dr. Dickſon has ſtated that the proportion that is neceſſary, is variable according to the nature of the land, and the manner in which the crop is cultivated. In the broad-caſt method, from eighteen to twenty pounds may be proper, while in that of the drill, it will be conſiderably leſs, according to the diſtances at which the operation is performed. In two feet equidiſtant rows, the uſual allowance is about ſix pounds; in thoſe of eighteen inches about eight pounds; in thoſe of twelve inches, ten or twelve pounds; and in nine-inch rows, ſixteen or eighteen pounds may be neceſſary, though Mr. Young only recommends from twelve to fifteen pounds for the acre.

Time and Manner of Sowing.—In his ſyſtem of agriculture, the ſame writer ſtates, that “the moſt proper ſeaſon for putting this ſort of crop into the ground, is as early as can be done in the ſpring months, as in this way the plants may be fully eſtabliſhed before the ſeaſon becomes too hot. The latter end of March, for the more ſouthern diſtricts, may be the moſt proper period; and the beginning of the following month for thoſe of the north. When ſown late there is more danger of the plants being deſtroyed by the fly, as has been obſerved by Mr. Tull. If the plants be intended to be tranſplanted out in the garden method, it will alſo be the beſt practice to ſow the ſeed bed as early in the ſpring as the froſts will admit, in order that the plants may be ſtrong, and fit to ſet out about the beginning of Auguſt.”

In regard to the mode of ſowing or putting in the crop, this writer alſo ſuggeſts, that “it ſhould vary with the circumſtances of the ſoil, and the mode of after-management that can be adopted with the moſt convenience. Where much attention cannot be beſtowed on the buſineſs of hoeing and keeping the crop clean, the beſt method is that of ſowing the land broad-caſt; though in this method the crop may not laſt ſo long in the ground. But in caſes where the crops are capable of being kept in a ſufficiently clean condition by repeated hoe-culture, the drill may be more adviſable, particularly in narrow diſtances. The practice of tranſplanting can, perhaps, only be done in particular caſes, on ſmall pieces of deep land that are in great heart, and require the plants in conſequence to ſtand thin and regular upon the ground, as in theſe modes they become large and of vigorous growth. In ſoils that are inclined to moiſture at ſome depth below the ſurface, it may be a uſeful method of keeping the roots of the plants from being injured by their penetrating too deeply, as is more the caſe when the plants riſe from ſeed. The ſeed may be ſown either alone or with grain crops, in the ſame manner as clover; each method has its advocates, and it is probable that they may be uſeful under different circumſtances, as in the deeper and more fertile ſorts of land the firſt may be the moſt beneficial method, and in thoſe of the lighter and leſs deep kinds the latter; as in the deep ſorts of land there may be leſs loſs of time in procuring the green produce for horſes or other ſorts of ſtock, as well as a greater certainty of the crop ſucceeding. But in the lighter and more porous ſoils, by being ſown with corn, the plants may be better protected in their early growth, as well by the ſhade as the moiſture that will, in that way, be preſerved. Some indeed ſpeak of its ſuperior utility on the ground of long experience, in its being better preſerved from the fly. Wherever this mode is made uſe of, the grain ſhould, however, be ſown thinner than is uſually the caſe, in proportion as the ſoils are more rich. Oats are preferable to barley for the purpoſe, as being leſs liable to lodge, eſpecially when ſown thin. From five or ſix pecks to three buſhels, ſown as evenly as poſſible, may be the beſt proportions, the ſmaller quantity being neceſſary on the richeſt ſoils.” Mr. Young remarks, that “the greateſt ſucceſs by far that has been known is by the broad-caſt method, which is nearly univerſal among the beſt lucern farmers, even among men who admire and practiſe the drill huſbandry in many other articles. But as they moſtly (not all) depend on ſevere harrowing for keeping their crops clean, which is a troubleſome and expenſive operation, he ſtill ventures to recommend drilling, but very different drilling from that which has been almoſt univerſally practiſed, *viz.* at diſtances of eighteen inches or two feet. Objections to theſe wide intervals are numerous. If kept clean hoed, the lucern licks up ſo much dirt, being beaten to the earth by rain, &c. that it is unwholeſome, and the plants ſpread ſo into theſe ſpaces that it muſt be reaped, which is a great and uſeleſs expence. For theſe reaſons, as well as for ſuperiority of crop, he recommends drilling at nine inches, which, in point of produce, mowing, and freedom from dirt, is the ſame as broad-caſt; and another advantage is, that it admits a ſcarifying once a year, which is much more powerful and effective than any harrowing. Theſe facts are ſufficient to weigh ſo much with any reaſonable man, as to induce him to adopt this mode of drilling, as nearer to broad-caſt by far than it is to drills at eighteen or twenty-four inches, which open to a quite different ſyſtem, and a ſet of very different evils. Nine-inch rows might *practically*, but not literally, be conſidered as broad-caſt, but with the power of ſcarifying.” And in regard to “the material point, of with or without corn, two conſiderations preſent themſelves. One is, the extreme liability of lucern to be eaten by the fly, which does great miſchief to many crops, when very young, and againſt which the growing corn is ſome protection. The value of the barley or oats is another object, and not to be forgotten. It is alſo gained in the firſt year's growth of the lucern, which is very poorly productive, even if no corn be ſown, ſo that he muſt own himſelf clearly an advocate for drilling it among corn, either between the rows of nine-inch barley, or acroſs drilled barley at a foot; perhaps the latter is the beſt method, as there is leſs probability of the crop being laid, to damage the lucern. The quantity of ſeed-corn ſhould alſo be ſmall, proportioned to the richneſs of the land; from one buſhel to a buſhel and a half, according to the fertility of the ſoil; another ſecurity againſt the miſchief of *lodging*. If theſe precautions are taken, it would be preſumptuous to ſay that ſucceſs muſt follow, *that* being always, and in all things, in other hands than our's; ſeed may prove bad, the fly may eat, and drought prevent vegetation, but, barring ſuch circumſtances, the farmer may reſt ſatisfied that he has done what can be done; and if he does ſucceed, the advantage will be unqueſtionable.”

In the broad-caſt mode, in every caſe, as ſoon as poſſible after the grain has been ſown and harrowed properly in, the lucern ſeed ſhould be immediately put in in that mode, by a regular even caſt over the fine ſurface, covering it with a light ſeed-harrow, but it ſhould not be too deeply covered in, two inches being fully ſufficient. In the drill method, the ſame ſyſtem ſhould be followed, the lucern ſeed being drilled in immediately after the corn has been put into the ſoil.

It need hardly be noticed that the plats of ground ſown for the purpoſe of raiſing plants, to be ſet out in the garden method of culture, ſhould always be without grain, or other ſorts of crops, in order that they may admit of having the plants properly thinned out and kept clean, and in a vigorous ſtate of growth, for being ſet out with the moſt advantage and ſucceſs poſſible.

With regard to the proper diſtance of the rows, it may in addition be obſerved, where the drill mode of culture is practiſed, it ſhould probably depend upon the ſtate and circumſtances of the ſoils. Mr. Kent adviſes two feet as the beſt diſtance in all caſes; while others think equal diſtances of a foot in rich ſoils, ſuch as are worth from thirty to forty ſhillings the acre, and nine inches in thoſe that are of inferior fertility, as from fifteen to twenty ſhillings the acre, the beſt general diſtances. On ſoils of leſs value it is probable that this culture can ſeldom be had recourſe to with much benefit to the farmer. The laſt diſtance approaches much to the broad-caſt method, which is contended by ſome as the moſt appropriate in almoſt all caſes, and of courſe it may be preferable, as it admits of being plowed between by a ſuitable plough, in the room of the harrowed method, and the obſervations made above are decidedly in favour of the method.

In whatever method this ſort of ſeed may have been ſown, it is, when good, quick in its vegetation, beginning to ſprout in the courſe of a week, and ſoon ſpreading the plants over the ſurface of the land. And the ſooner it obtains its rough leaf the better, as it is then like turnip-plants, out of danger of being deſtroyed by the fly. But before theſe plants arrive at this ſtate of growth, they are liable, eſpecially in dry ſeaſons, to be much injured, if not wholly conſumed, by the ravages of the ſame ſort of inſect as that which is ſo detrimental to the turnip crops. "Where the greateſt part of the plants are injured in this way, the author of "Practical Agriculture" thinks it is probably the beſt method, when the crop has been put in alone, to plow up the land, and ſow it down again with freſh ſeed, as ſoon as poſſible." And this he ſuppoſes "is an advantage which the ſowing the crop alone has over that of putting it in with thoſe of other kinds."

After Culture.—It may be ſtated in regard to the after-management of this graſs, that, as the economy of the plant is ſuch as to render it incapable of being grown with much advantage, where other ſorts of plants, whether of the graſs or weed kind, are apt to annoy it; much care and attention ſhould of courſe be employed in keeping it clean and free from the intruſion of all ſuch vegetable productions. This, the ſame author thinks, "may be effected in different ways, according to the methods in which the crop has been raiſed. Where the broad-caſt plan has been purſued, little is neceſſary, where the land has been properly prepared after the grain crop has been removed, except keeping all ſorts of heavy ſtock from coming upon it. In a dry ſeaſon, if there be occaſion, the field may however be fed a little by calves, and other very light ſtock, but they ſhould never be kept long upon the plants at one time. When the ſecond cutting has been made in the following year, if any graſs ſhows itſelf the land ſhould be harrowed over in a moderate manner, by a harrow which is not too heavy nor too long in the tines, two or more times, as may be neceſſary in different directions, the graſſy matter being collected by a ſmall light implement of the ſame kind, and removed from the land. This buſineſs ſhould be executed as ſoon in the early part of the ſpring as the nature and ſtate of the ground will admit, as dry a period as poſſible being taken for performing the work. In the ſucceeding years two ſuch harrowings may be frequently required, one in the early part of the ſpring ſeaſon, and the other in the cloſe of ſummer. But in theſe caſes, eſpecially where there is much graſs appearing, a much heavier ſort of harrow ſhould be made uſe of." In the 25th vol. of the Annals of Agriculture, one is adviſed of ſuch a weight, as is ſufficient for four horſes, and which does not ſpread more than four or five feet; but in moſt caſes, eſpecially where the work is ſo frequently performed, one that requires leſs draught may be adequate to the purpoſe, as where ſuch large heavy harrows are employed, there is much danger in injuring the crowns of the plants, and thereby cauſing their deſtruction; whereas by the uſe of the lighter ones, they are moſtly much benefited from the mould being ſtirred about their roots. After theſe operations, as in the above caſe, the weeds ſhould be brought together, and removed from the ground. When the crops are thin and patchy, ſeed in proportion to the deficiencies ſhould be ſown over ſuch places before the harrowings commence each time. In every caſe the roller ſhould be applied immediately after the operation has been performed, not only for the purpoſe of compreſſing the mould about the roots of the plants, but to render the ſurface perfectly level and fit for the ſcythe. In this method of culture, "where the produce is not to ſome extent, it is probably better to feed the crop by light cattle-ſtock in the autumn than mow it."

In reſpect to the drill-ſown lucern, it is recommended, "where the rows are ſufficiently evident, in the autumn ſeaſon, after the grain has been ſecured, that a ſmall ſhim ſhould be paſſed between them, in order to extirpate all the weeds and graſſy materials, as well as to looſen the mould about the roots of the plants, and that they may be rendered more perfectly clean, the hand-hoeing of the plants in the rows: and that, in the ſucceeding year, ſtill more particular attention to the uſe of the ſhim and hoe will be requiſite. The buſineſs ſhould be begun as early as the ſtate of the ſoils will ſafely admit of its being executed: being continued occaſionally in ſuch a manner, as to induce the cultivator to leave it again for the production of this graſs. In ſituations where ſuch grounds could be conveniently flooded or covered with water occaſionally, they might therefore be very advantageouſly converted into good meadow or graſs-lands; a ſort of application that has long ſince been recommended by De Serres, a French writer of great reſpectability: when ſuch lands are perfectly broken up, they afford, in moſt caſes, admirable crops of the grain kind: oats, as being leaſt injured by a luxuriant growth, may, in general, be the moſt adviſable as the firſt crop."

It has been adviſed, "as a good rule in theſe caſes, to give good hoeings, either of the horſe or hand kinds, as ſoon as weeds appear every time after the crops are taken off. If the plants are perfectly ſtraight in the rows, which ſhould always be the caſe, a ſhim may be had recourſe to with the greateſt benefit, as it may be drawn ſo cloſely to the plants, as in a great meaſure to ſave the expence of hand-hoeing, as, in ſuch caſes, it will be only neceſſary to extirpate the weeds or natural graſs plants that may have eſtabliſhed themſelves among the lucern plants in the rows, which is capable of being effected in a very complete manner by the uſe of a pronged hand-hoe. And it is further recommended never, by any means, to ſuffer fields of this ſort to become weedy, under the ſuppoſition, that the produce may not cut well, or be free from duſt; as where it is of ſufficiently vigorous growth, and of a ſuitable diſtance in the rows, according to the nature of the land, there can be no reaſon for ſuch an injurious practice, as it is only where the planting is executed at larger diſtances than the condition of the ſoil will permit, that any inconvenience can be experienced in this way."

It may be ſtated, that "where hand-hoeing is the method chiefly depended on for keeping crops of lucern in a proper ſtate of culture, much of the buſineſs may be performed by women, or even children, and the expence be thus conſiderably leſſened."

Application of Manure.—In caſes where the ſoils on which this plant is grown are not of conſiderable fertility, the occaſional application of manure may be of great advantage, in thickening and increaſing the quantity of crop; for this uſe clean well rotted dung is probably by much the beſt manure, as where earthy compoſts, aſhes, or ſoot are employed, they are apt to promote the growth of, or bring up graſſes too much; the latter are, however, ſometimes ſown over the crop in the winter ſeaſon. The dung is adviſed, in the 25th vol. of the Annals of Agriculture, to be applied in the quantity of about twenty tons to the acre, every five or ſix years. Mr. Kent, however, thinks it a better practice to put a ſlight coat on annually in the ſpring ſeaſon. As much expence might be incurred in the culture, eſtabliſhment, and after management of this ſort of crop, in order to inſure a favourable produce, the farmer ſhould not too haſtily attempt it, till he has found how far it will ſuit his convenience and other circumſtances.

Expences of Cultivation.—The various expences attending it, as ſtated by different writers before the late riſe in the price of labour, are thus given, as well as the profit in ſoiling horſes. At preſent, however, a third more may be added, and, in ſome caſes, much more.

Expences.

	£.	s.	d.
Two ſpring ploughings extra	0	18	0
Harrowings	0	2	6
Eight pounds of ſeed	0	8	0
Driling	0	2	6
Horſe-hoeing in autumn	0	2	6
Hand-hoeing ditto	0	5	0
Firſt year	1	18	6

Annual Expences afterwards.

	£.	s.	d.
To rent, tithe, and rates	1	10	0
Four horſe-hoeings	0	10	0
Three hand-hoeings	0	12	0
Five mowings	0	12	6
Raking together	0	5	0
Loading and carting home	0	7	6
Manuring, to amount *per annum*	0	12	0
	4	9	0
Clear profit	9	18	6
	14	7	6

Profit in the Practice of Soiling Horſes.

	£.	s.	d.
By keeping five horſes, from beginning of May to middle of October, at 2*s.* 6*d.* *per* horſe, *per* week	14	7	6
	14	7	6

Nearly double this is ſometimes made by ſoiling clover.

Number of Cuttings and Manner of Cutting.—In a late practical work, it is ſtated that, "as this is one of the moſt forward of the artificial graſſes, it frequently attains a ſufficient growth for the ſcythe towards the end of April, or beginning of the following month; and in ſoils that are favourable for its culture, will be in a ſtate of readineſs for a ſecond cutting in the courſe of a month or ſix weeks longer, being capable of undergoing the ſame operation, at nearly ſimilar diſtances of time, during the whole of the ſummer ſeaſon. In this laſt ſort of ſoil, with proper management, in the drill method, it has been found to riſe to the height of a foot and a half in about thirty or forty days, affording five full cuttings in the ſummer. But in the broad-caſt crops, in the opinion of ſome, there are ſeldom ſo many cuttings afforded in the ſeaſon, three or four being more common, as the growth is ſuppoſed to be leſs rapid, than by either of the other modes:" this is, however, contradicted by other cultivators, who have beſtowed much care on the ſubject, as will be evident hereafter. And it is ſtated, that "in order to have new ſucceſſions of this graſs conſtantly becoming ready to be cut, it has been recommended, for the purpoſe of ſoiling, to have the broad-caſt plantations formed into ſo many diviſions, as that one of them may be cut daily, as about ſixty; and thoſe of the drilled, and tranſplanted kinds, into from thirty to forty, according to the nature of the land, conſuming them in the ſame manner. Theſe cuttings muſt, however, be varied in proportion to the differences in the growth of the crops, and the conſumption. The moſt economical mode of cutting the produce is, without doubt, by means of the ſcythe, though the reaping-hook has been made uſe of by ſome; after being cut, the food ſhould be conveyed, as ſoon as poſſible, to the animals: this may be done by a light cart, or large barrow, made for the purpoſe, according to the ſcale on which the buſineſs is conducted. One cutting in the day is only adviſed by ſome, but as there is a loſs as well as injury done to all ſorts of green-cut food by keeping, even for a few hours in hot ſeaſons, it may be a better practice to have two cuttings in the day, eſpecially when the weather is warm, and the lucern at no great diſtance; beſides, the food is eaten better when quite freſh."

Value and Application of.—It is ſtated, that "the produce of this ſort of crop, in converting it to the purpoſes of ſoiling cattle, will neceſſarily be different under different circumſtances, but an acre can ſeldom, when under proper culture and management, ſupport leſs than from three to five or ſix horſes, or other cattle, during the ſix ſummer months, the profit of which cannot be leſs than from ſeven to ten or twelve pounds." "And in letting it remain for hay, which is leſs advantageous, in three mowings, an acre, where the crop is good, will ſeldom afford leſs than from three to five tons of dry hay. In Mr. Arbuthnot's trials, as ſtated in Mr. Young's Tour, the produce was four loads, but in thoſe of others, on rich grounds, it was five. It is likewiſe remarked, that "in making this ſort of plant into hay, the ſame directions ſhould be attended to as for clover; the leſs the produce is ſhaken about the better, provided it be ſufficiently quickly dried, as the leaves will be more fully preſerved in the ſtems, and the hay, of courſe, more valuable. From its greater ſucculence, it will, in common, require rather more time than clover, or ſaintfoin, in making into hay. As this ſort of hay is held in leſs eſtimation than that of either of the above graſſes, it ſhould always be conſumed at home by the farm horſes, or other ſtock; and that of the other ſorts ſent for ſale."

But the principal and moſt advantageous practice, in the application of lucern, is that of ſoiling horſes, neat cattle, and hogs; yet as a dry fodder, it may alſo be capable of affording much aſſiſtance in many caſes; and as an early food for ewes and lambs, be of great value in particular caſes. "As this plant bears repeated cutting, better than moſt of thoſe of the artificial graſs kind, ſprings in a more quick and expeditious manner, and affords a healthy nutritious food, it muſt be of vaſt utility to the farmer, where horſes and cattle form a large part of his ſtock; with horſes in this way, it has been found by ſome, as ſtated in the fourth volume of Mr. Young's Eaſtern Tour, 'to anſwer better than any other ſort of green food that has been tried. The number of cuttings that it admits of, being on different ſoils, and under different modes of culture, from about three to five, affording a produce of green herbage adequate to the ſupport of from three to four or five horſes, for a period of nearly ſix months in the ſummer ſeaſon, as has been ſeen above;' and though much of this vaſt advantage, in the ſupport of theſe animals, may with propriety be aſcribed to the economy of the conſumption of the food, that unavoidably takes place in this excellent practice, the real produce in green food, is, without doubt, larger than in moſt other graſs crops. The broad-caſt crops, in the trials of ſome cultivators, appear to have been more profitable, in this mode of conſuming the produce, than thoſe of either the drilled or tranſplanted methods of culture; in the practice of Mr. Hall, the former ſupported from four to five horſes for twenty-ſix weeks, while the tranſplanted crop, in rows two feet aſunder, only afforded produce ſufficient for the keeping of three. And in thoſe of Mr. Clayton, in the broad-caſt method, without grain, five horſes were kept from the middle of May till Michaelmas, while that drilled in equidiſtant rows, at the diſtance of eighteen inches, only ſupported four." There are many other facts, that lead to the ſame concluſion. "On very rich ſoils, the drilled lucern will, without doubt, when the plants are kept perfectly clean, and the mould well ſtirred between the rows, and laid to their roots, afford an abundant produce, perhaps more ſo than in the broad-caſt; but to do this, great attention in the culture muſt be beſtowed." And in "its application, in the ſoiling of cows, and other ſorts of cattle, in the fold yards, and in the feeding and fattening of oxen, its importance is equally great. It is found that in ſoiling cows, the proportion of this ſort of food, conſumed in twenty-four hours, is from about ſixty or ſeventy, to upwards of a hundred pounds, in thoſe which are of the middling-ſized kinds; an acre maintaining in the proportion of about four for twenty weeks. In other trials, larger proportions of ſtock have been kept by this practice." In feeding cattle with this ſort of food, it is obſerved, that "in its green ſtate, care is neceſſary, however, not to give the animals too much at a time, eſpecially when it is moiſt, as they may be *hoven* or *blown* with it, in the ſame way as with clover." The trials, it is added, that have been made in fattening bullocks or other cattle with this green fodder, are not numerous, but they are ſufficiently ſo to prove its utility in ſuch application. In Mr. Young's trials, cattle have been found to increaſe faſt in fleſh by it, paying at the rate of four ſhillings and ſixpence a head *per* week, which is conſidered as a great proof of the value of the plant in this view. Its ſuperiority to tares is prodigious. It has alſo been conſidered of the greateſt value in this view, in Ireland, by Mr. Herbert, after much experience of it. The great power which it poſſeſſes in fattening is rendered indeed ſufficiently evident, by the ſudden effects which it produces in this way, in ſoiling horſes; in moſt inſtances they get into high condition, in a ſhort time becoming "fat, without oats or hay," in ſome caſes. And "ſheep have likewiſe been fattened on this green food with great ſucceſs, in Mr. Baldwin's trials." Alſo, "in ſoiling hogs in the fold yards, it has been attended with conſiderable ſucceſs—and it has been ſuggeſted that as theſe animals do not bite ſo cloſely as ſheep, they may be admitted upon the crop with ſafety."

And the advantage of this mode of application over that of making the crops into hay, and their expence, produce, and profit, are ſtated by Mr. Young in this way.

Average of Five Crops.

Soils.	Application.	Expences.			Product.			Profit.		
		£.	s.	d.	£.	s.	d.	£.	s.	d.
Light ſandy loam - - - -	Soiling -	1	14	6	13	0	0	11	5	6
Rich black loam - - - -	Soiling -	5	0	8	11	5	0	6	4	4
Good loam - - - - -	Soiling -	3	15	0	14	7	6	10	12	6
Good loam - - - - -	Hay -	3	3	6	9	0	0	5	16	6
Rich deep ſandy loam - - -	Soiling -	3	11	1	7	0	11½	3	13	11½
Averages - - - - - -	- -	3	8	11	10	8	8	7	10	5

Further, the reſult of the comparative experiment made by Mr. Anderton with this crop, and thoſe of burnet and ſaintfoin, as ſtated by the ſame writer in his Eaſtern Tour, ſhews its ſuperiority over them clearly.

Lucern, at four cuttings, green, produced	159
Burnet - - - -	84
Saintfoin - - - -	82

And the advantages of making them into hay, are thus ſtated:

One cutting of each.

Lucern, in graſs,	57½ lb.	in hay,	22 lb.
Burnet, in ditto,	25½	——	7
Saintfoin, in ditto,	29½	——	9

Although lucern crops ſhould not be cloſely fed down with ſheep, it is not improbable but that "in particular caſes they may be applied as an early green feed for ewes and lambs with great utility and convenience, as they may be relied on for this ſort of feed much ſooner than any of the other kinds of artificial graſs crops, eſpecially in ſoils of the rich, dry, and warm deſcriptions, being often ready for this purpoſe ſoon after the middle of March, affording a good bite through the whole of the following month; the moſt difficult period for the providing of ſuitable ſupport for this kind of ſtock. The benefit in the healthy growth and improvement of the lambs in this mode, will much more than counterbalance any loſs ſuſtained in the firſt cut, for the ſoiling of horſes. The ſheep ſhould not, however, remain on longer than while the freſh ſhoots are eaten down." And it is concluded on the whole, that "though this plant is capable of being thus uſefully applied, conſidering the great expences which are neceſſary in raiſing and keeping lucern crops in a ſtate of production, and their affording but little produce, eſpecially when ſown without corn, for the two firſt years, notwithſtanding they appear to yield a great advantage in the practice of ſoiling animals; it is probable that much of the profit depends upon the method of conſuming them, and not on that of the particularly advantageous nature of the plant. Its ſuperiority to clover, when the differences in the expences of their culture, and other circumſtances, are fairly brought into view, will not perhaps appear ſo great as many, on a ſuperficial obſervation, may have ſuppoſed. The point in which it moſt materially excels that almoſt invaluable plant, is, the duration, or time, which it laſts in the ground, after being once introduced, continuing from ten to fifteen and even twenty years, according to the ſtate and nature of the ſoil and the attention that is beſtowed in the after management. This is a circumſtance of the firſt importance, in caſes where the cultivator wiſhes to avoid the trouble and expence of grain crops, as he can keep a ſuitable extent of land under this crop, for the purpoſe of ſoiling his ſtock without them, while with clover it is utterly impoſſible. Where the proportion of land is ſmall, and the quantity of cattle and horſe ſtock diſproportionately large, it is a plant admirably calculated for the cultivator's purpoſe, when grown convenient to the farm-yards, and kept in due order by proper cultivation. In has alſo been recommended on dairy farms, as of great utility in ſupporting the cows, and increaſing the quantity of milk. Where the ſoils are ſuitable, a few acres under this graſs, round the houſe, muſt in almoſt all caſes be valuable for the purpoſe of early green food."

The advantages of cultivating lucern are conſidered by Mr. Young ſo extremely great, that the "agriculturiſt ſhould, he thinks, determine at all events to have ſufficient at the leaſt, for the ſummer ſupport of all his teams, and other horſes; and if in addition to this quantity, he provides alſo for thus feeding much other ſtock in his farm-yard, he will find it a moſt profitable practice."

Breaking up old Lucern Grounds.—It has been already ſuggeſted, that "on attempting to break up lands that have been long under this ſort of crop, it has been ſometimes found, from the great ſtrength of the roots of the lucern plants, and the conſequent difficulty of deſtroying them, that they have been reſtored in ſuch a manner, as to induce the cultivator to leave them again for the production of this graſs." And that in ſituations where ſuch grounds could be conveniently flooded or covered with water occaſionally, they might be very advantageouſly converted into good meadow or graſs lands. A ſort of application, that has long ſince been recommended.

In cutting lucern crops, the author of the Farmer's Calendar ſuggeſts that it ſhould always be performed in a longitudinal direction of the drills, or rows, or of the field, in order that a ſcarifying may be given to the young growth before it is too far advanced. And the ſame writer remarks, that this ſort of crop requires much manure, for though on good land it may afford a good produce, without ſuch application; to carry its cultivation to the higheſt ſtate of perfection, "not only of *product* but alſo of *clear profit*," it ſhould have plenty.

But though this ſort of plant is ſeldom liable to be injured by the froſt, in the ſouthern diſtricts of the kingdom, where it is the moſt extenſively cultivated, a writer in an uſeful periodical work, complains that in an experiment of his, in which the lucern was drilled about a foot diſtant in the rows, it deſtroyed every plant. "A few indeed, (ſays he,) at diſtant intervals, recovered in the ſpring, and grew very decently, puſhing out long, ſtrong, and carrot roots; but their number was ſo inconſiderable, and the weeds ſo abundant and luxuriant, that it became neceſſary to plow all down." In this caſe the land does not ſeem to have been in a proper ſtate of either preparation or heart for the growth of this ſort of crop. And it is ſuggeſted, that in giving this ſort of food to cows, it is neceſſary to have the precaution of letting it be made uſe of the day after it is cut, and not the ſame day, as in this caſe the animal is liable to ſwell. In his trials it was found that a large cow conſumed about eighty-four pounds of this food in twenty-four hours, and that if more be given, the animal will probably waſte it. And it is added, that the butter made from milk produced from this ſort of food, is equal to any made from cows fed on the beſt meadows and paſtures.

LUCERNA, in *Geography*, a town of France, in the department of the Po, lately belonging to Piedmont, in the province of the Four Vallies, to one of which it gives name; five miles S.W. of Pinerolo.

LUCERNA, in *Ichthyology*, a ſpecies of *Trigla*; which ſee.

LUCERNARIA, in *Natural Hiſtory*, a genus of the Vermes Molluſca claſs and order. Body gelatinous, wrinkled, branched; mouth placed beneath. There are three ſpecies, which inhabit the Northern ſeas, and live among the "fuci" and "ulvæ," generally adhering firmly to their habitation, and rarely changing their abode; they feed on polypes, or oniſci; the body is commonly headleſs and eyeleſs, with granulated tubercles.

Species.

QUADRICORNIS. Body long coiled, with four forked arms tentaculate at the tip. Inhabits fuci, and feeds on polypes. The body is without head or eyes, brown, pellucid, quadrangular, each angle running into an arm, the branches of which are terminated by a faſciculus of thirty or forty tentacula; tail flexuous in the middle and diſpoſed in numerous plaits and folds, thickened at the baſe and tapering gradually, obtuſe at the tip, and extenſile, like the tentaculæ; mouth white with cinereous ſtriæ, and four-toothed.

PHRYGIA. Body long papillous, with numerous globeriferous arms deflected into an hemiſphere; fixed at the baſe by a byſſus or maſs of filaments. This is found in the Greenland ſeas at a conſiderable depth, and ſeldom changes its abode. Body varying in ſhape, about half an inch long, reddiſh with white globules and papillæ; neck erect, exſertile, and beſet with numerous exſertile papillæ; arms ſhort, ſlender, and entangled together.

AURICULA. Reſembling an oil-flaſk; neck round, the lower extremities dilated and ſurrounded with eight faſciculi of tentacula. This ſpecies is likewiſe found in the Greenland ſeas, adhering very firmly to the largeſt ulvæ, from which it rarely moves; feeds on oniſci, and is about an inch and a half long. Body black or reddiſh, rarely cheſnut-brown with a gold tinge, lubricoſe, glabrous, the margin ſurrounded with eight granulate tubercles, reſembling ſo many faſciculi of tentacula, containing about ſixty in each; theſe are black tipt with white; mouth white.

LUCERNATES, in the *Eccleſiaſtical Hiſtory*, a term uſed by the primitive Chriſtians for canticles, which they ſung in their nocturnal aſſemblies; probably from theſe rites being performed by lamp-light.

LUCHNOW Hills, in *Geography*, a range of mountains in Hindooſtan, between the circars of Ruttunpour and Goondwana; the paſſage over which is called "Luchnow Paſs," and is ſituated about eight miles W. of Kyragur.

LUCHO, a town of the principality of Pomerelia; 12 miles S.W. of Dantzic.—Alſo, a town of the principality of Luneburg, on the Jetze, in a moiſt ſoil, ſo that moſt of the houſes are erected on piles; 40 miles E.S.E. of Luneburg. N. lat. 52° 58′. E. long. 11° 17′.

LUCHOWICZE, a town of Lithuania, in the palatinate of Novogrodek; 40 miles S.S.E. of Novogrodek.

LUCIA, St., or, as it is called by the French, *St. Alouſie*, from its having been diſcovered on St. Lucia's day, one of the Charaibe or Caribbee iſlands in the Weſt Indies, about 27 miles in length from N. to S., and 12 broad. In this iſland are ſeveral hills, two of which are remarkably round and high, and ſaid to have been volcanoes. At the foot of theſe hills are fine vallies, well-watered, and having good ſoil, that produces trees, the timber of which ſerves the planters of Martinico and Barbadoes for building their houſes and windmills. The iſland alſo ſupplies plenty of cocoa and fuſtic. The air, fanned by the trade winds, which, by the arrangement of the hills, are admitted into the iſland, and thus moderating the heat, is reckoned ſalubrious. The iſland has ſeveral good harbours and bays, which afford commodious anchorage; particularly the "Little Careenage," which is accounted the beſt in all the Caribbees, and which induced the French to prefer it to the other neutral iſlands. This harbour poſſeſſes ſeveral advantages, ſuch as its depth, the excellent quality of its bottom, and its convenient careening places. Thirty ſhips of the line may lie here ſheltered from hurricanes, without the trouble of mooring them. As to the other harbours, the winds are always favourable for going out, and the largeſt ſquadron may be in the offing in leſs than an hour. In the iſland are nine pariſhes, eight to the leeward, and only one to the windward. A high road is made round the iſland, and two others which croſs it from E. to W., and thus afford an eaſy conveyance of the commodities of the plantations to the barcaderes, or landing places. In the year 1769, the free inhabitants of the iſland amounted to 2524; the ſlaves to 10,270. Of cattle it had 1819 horned beaſts, and 2378 ſheep, beſides 598 mules and horſes. Its plantations conſiſted of 1,279,680 plants of cocoa; 2,463,880 of coffee; 681 ſquares of cotton; and 254 of ſugar canes: 16 ſugar works were actually at work, and 18 nearly completed. Its produce yielded 112,000*l.*, which was capable of being improved to 500,000*l.* After the Engliſh had been ſettled for ſome time in this iſland, the Charaibes, inſtigated by the French in the year 1638, either killed or drove from the iſland the Engliſh ſettlers with their governor. When the civil wars broke out in England, a party of French arrived here, under a perſon named Rouſſelan, well provided with ſtores and ammunition. Rouſſelan recommended himſelf to the Charaibes, ſo that he and his colony carried on an advantageous trade; but upon his death in 1654, he was ſucceeded by La Riviere, who with his whole colony was maſſacred by the Charaibes. It is needleſs to recount the attempts made by the French, and alſo by the Engliſh in 1672, and at a later period in 1723, to obtain and preſerve a ſettlement in this iſland. At length, when the Engliſh were compelled to relinquiſh all hopes of obtaining this and other iſlands by force, St. Vincent, Dominica, Tobago, and St. Lucia were declared neutral by the treaty of Aix-la-Chapelle in 1748; and thoſe who remained of the ancient proprietors were left in unmoleſted poſſeſſion. The treaty of neutrality was no ſooner concluded, than both Engliſh and French appeared diſſatisfied with the arrangement they had made. The Engliſh, in particular, diſcovered, that by acceding to the compromiſe, they had given up St. Lucia, an iſland worth all the reſt, and to which, it muſt be owned, they had ſome colourable pretenſions, founded on a treaty entered into with the Charaibean inhabitants in 1664, 600 of whom attended an armament that was ſent thither by lord Willoughby, and actually put the Engliſh publicly and formally into poſſeſſion. By the peace of Paris, February 1763, the three iſlands of Dominica, St. Vincent, and Tobago were aſſigned to Great Britain; and St. Lucia to France in full and perpetual ſovereignty; the Charaibes not being once mentioned in the whole tranſaction, as if no ſuch people exiſted. The Engliſh took this iſland in the year 1779, but reſtored it at the peace in 1783; it was retaken by the Engliſh in 1794, reſtored in 1795, and retaken in 1796; reſtored and recaptured in 1803. N. lat. 13° 37′. W. long. 60° 30′.

Lucia, *St.*, a town of Sicily, in the valley of Demona; ſeven miles N. of Meſſina.—Alſo, a town of the iſland of Corſica; ſix miles N.E. of Corte.—Alſo, one of the ſmaller Cape Verd iſlands, about 24 miles in length, high and mountainous. On the E. ſide is a harbour, defended by two ſmall iſlands, which afford good ſhelter and anchorage. N. lat. 16° 46′. W. long. 24° 30′.—Alſo, a town of South America, in the government of Buenos Ayres, on the E. ſide of the river Plata; 140 miles N. of Santa Fé.—Alſo, a town of Brazil, in the government of Goyas, on the river Tocantins. S. lat. 12° 20′.—Alſo, a town of South America, in the government of Buenos Ayres, on the Parana; 110 miles S. of Corientes.—Alſo, a town of Peru, in the government of Arequipa; 50 miles S.E. of Arequipa.—Alſo, a town of South America, in the audience of Quito, on the Daûlé; 35 miles N.N.W. of Guayaquil.—Alſo, a town of Italy, in the Treviſan; 20 miles E.S.E. of Trevigio.—Alſo, a river of Africa, which runs into the Indian ſea; S. lat. 28 .—Alſo, a river of America, in Eaſt Florida, which runs S.E. along the E. ſide of the peninſula, and communicates inland with the Indian river.

Lucia *Bay*, *St.*, a bay on the E. coaſt of the iſland of Borneo. N. lat. 4° 16′. E. long. 117 18′.

LUCIAN, in *Biography*, a diſtinguiſhed Greek writer, a native of Samoſata, on the banks of the Euphrates, was born in the reign of Trajan, of mean parentage, and in his youth was placed with his uncle to learn the art of a ſtatuary. Having no genius for the profeſſion, and failing of ſucceſs in ſome of his firſt attempts, he withdrew from his maſter, and went to Antioch, where he engaged in literary ſtudies, and embraced the profeſſion of a pleader. He reported, that he was induced to this ſtep by a dream, in which Learning ſeemed to draw him to her, and to promiſe to his efforts fame and immortality. He was ſoon diſguſted with the contention of the bar, and confined himſelf to the practice of eloquence as a ſophiſt or rhetorician, in which capacity he viſited ſeveral foreign countries, particularly Greece, Italy, Spain, and Gaul. The emperor M. Aurelius was ſenſible of his great merit, and appointed him regiſter to the Roman governor of Egypt. He died about the year A.D. 180, when he had attained the great age of 90. The works of Lucian, which are numerous, and written in the Attic dialect, conſiſt chiefly of dialogues, in which he introduces different characters with much dramatic propriety. His ſtyle is eaſy, ſimple, elegant, and animated, and he has ſtored his compoſitions with many lively ſentiments, and much of the true Attic wit. His frequent obſcenities, and his vulgar manner of expoſing to ridicule almoſt every kind of religion, have drawn upon him the cenſure of moraliſts in all ages. The beſt editions of Lucian's works are thoſe of Bourdelot, Paris 1615; of Grævius, Amſt. 1687; of Reitzius, Amſt. 1743, and the Bipontine edition in 10 vols. 1789—93.

Lucian, (de elect. ſeu Cygnis,) is the only ancient writer who has dared to doubt of the muſical abilities of ſwans. He tells us, with his uſual pleaſantry, that he tried to aſcertain the fact, by making a voyage on the coaſts of Italy; and relates, that being arrived at the mouth of the Po, he and his friends had the curioſity to ſail up that river, in order to aſk the watermen and inhabitants concerning the tragical fate of Phaeton; and to examine the poplars, deſcendants of his ſiſters, whom they expected to ſhed amber inſtead of tears; as well as to ſee the ſwans repreſent the friends of this unfortunate prince, and hear them ſing lamentations and ſorrowful hymns, night and day, to his praiſe, as they uſed to do in the character of muſicians, and favourites of Apollo, before their change. However, theſe good people, who never had heard of any ſuch metamorphoſes, freely confeſſed, that they had indeed ſometimes ſeen ſwans in the marſhes near the river, and had heard them croak and ſcream in ſuch a diſagreeable manner, that crows and jays would be ſirens, compared with them, in a muſical capacity; but that they had never even dreamed of ſwans ſinging a ſingle note that was pleaſing, or fit to be heard.

LUCIAN, a Chriſtian martyr in the fourth century, is ſuppoſed to have been a native of Antioch, of which place he became a preſbyter. He was a pious and learned man, very eloquent, and well-ſkilled in the knowledge of the ſcriptures. He publiſhed an edition of the Septuagint, with corrections, ſuggeſted by a collation of ancient copies, which verſion was generally uſed in Jerome's time by the churches from Conſtantinople to Antioch. He publiſhed alſo an edition of the New Teſtament, the canon of which appears to have been much the ſame with that of other Chriſtians. Jerome does not commend theſe editions; he depreciates Lucian's Septuagint in compariſon with Origen's. It is certain that Lucian was in high eſteem with the Arians of the fourth century, and on that account it has been ſuppoſed that he adopted their principles; though he is claimed on the other ſide as the advocate of the doctrine of the Trinity; but Dr. Lardner, who has examined the queſtion with his uſual diligence, candour, and impartiality, obſerves, "Whether Lucian's opinion concerning the Trinity, particularly concerning the *Word*, was the ſame with that, which is now reckoned orthodox, or not, which is a point not eaſily determined; we have ſeen other accounts of him which are unqueſtioned; and all muſt be ſatisfied, that he was a pious, learned, and diligent man; that he believed Jeſus to be a divine teacher and the Chriſt." During the perſecution of the Chriſtians in the reign of Maximin, Lucian was apprehended, and conducted to Nicomedia, where the emperor then was. Here he was commanded, in the preſence of the monarch, to renounce the Chriſtian faith; this he not only refuſed, but delivered an able and very eloquent defence of it, of which the following is given in Lardner: "It is no ſecret, ſaid he, that the God whom we Chriſtians worſhip, is the one God declared to us by Chriſt, and by the Holy Ghoſt inſpired in our hearts. I own, that we alſo once truſted in gods of our own making, but Almighty God, commiſerating the errors of mankind, ſent his wiſdom into this world clothed in fleſh to teach us the knowledge of God, who made the heavens and the earth, who is eternal and inviſible. He, moreover, gave us a rule of life, and delivered to us the precepts of righteouſneſs; he taught us to practiſe ſobriety, to rejoice in poverty, to be very meek, to be willing to ſuffer, to preſerve the purity of our minds, to be patient at all times. He likewiſe foretold the things that have ſince happened to us; that we ſhould be brought before kings and rulers, and be ſlaughtered as victims; for which cauſe alſo, though he was immortal, as being the Word and Wiſdom of God, he yielded himſelf to death, that, whilſt he was in the body, he might ſet us an example of patience. Nor did he deceive us by dying, but on the third day roſe again, being innocent and unſpotted, and undergoing death only that he might overcome it by riſing again. Theſe things are well atteſted, and a large part of the world now acknowledge the truth of them." Upon this he was ſent to priſon, and ſpeedily put to death, but in what manner is not known. He was buried at Helenopolis. Lardner, vol. iii. edit. 1788.

LUCIANA, in *Geography*, a town of Spain, in the province of Seville; eight miles W.N.W. of Ecija.

LUCIANANO, a town of Etruria; 12 miles W. of Cortona.

LUCIANISTS, or LUCANISTS, a religious ſect, ſo called from Lucianus, or Lucanus, a heretic of the ſecond century, being a diſciple of Marcion, whoſe errors he followed, adding ſome new ones to them.

Epiphanius ſays, he abandoned Marcion; teaching, that people ought not to marry for fear of enriching the Creator: and yet other authors maintain, that he held this error in common with Marcion, and other Gnoſtics. He denied the immortality of the ſoul; aſſerting it to be material.

There was another ſect of Lucianiſts, who appeared ſome time after the Arians. They taught that the Father had been a Father always, and that he had the name even before he begot the Son; as having in him the power, or faculty of generation; and in this manner they accounted for the eternity of the Son.

LUCIANO, in *Geography*, a town of Spain, in New Caſtile; 19 miles W. of Civdad Reel.

LUCID INTERVALS, the fits of lunatics, or maniacs, wherein the phrenzy leaves them in poſſeſſion of their reaſon.

It is ſaid, lunatics are capable of making a will in their lucid intervals.

LUCIDA CORONÆ, in *Aſtronomy*, a fixed ſtar of the ſecond magnitude, in the northern crown. See CORONA *Borealis*.

LUCIDA *Hydræ*. See COR *Hydræ*.

LUCIDA *Lyræ*, a bright ſtar of the firſt magnitude, in the conſtellation *Lyra*.

LUCIDO, ST., in *Geography*, a town of Naples, in Calabria Citra; 11 miles W.N.W. of Coſenza.

LUCIDUM SEPTUM. See SEPTUM.

LUCIFER, in *Aſtronomy* and *Mythology*, a name given to the planet Venus, when ſhe appears in the morning before ſun-riſe.

LUCIFER, in *Biography*, a celebrated biſhop of Cagliari, the metropolitan city of the iſland of Sardinia, flouriſhed in the fourth century. He was one of the deputies ſent by pope Liberius to Milan, in the year 354, at the time when the emperor Conſtantius had ſummoned a council for the purpoſe of condemning Athanaſius. Lucifer, and Euſebius, biſhop of Verceil, adhered moſt ſtrenuouſly to the cauſe of Athanaſius, which ſo enraged the emperor that he baniſhed them into the Eaſt. Lucifer was ſent to a city in Syria, from whence he was removed to Eleutheropolis in Paleſtine. Here he wrote two books, in defence of Athanaſius and his ſupporters, with ſo much boldneſs, or perhaps violence, that St. Jerome ſays he muſt at the time have made up his mind to the ſuffering of martyrdom. Theſe books he not only made public, but ſent a copy of them to Conſtantius, in his own name. The emperor, amazed at his intrepidity, deſired them to be returned to the biſhop, in order that he might have an opportunity to acknowledge or to diſavow them. The prelate avowed himſelf the author, and knowing the probable conſequences, ſaid he was ready to ſuffer death in defence of what he had written and done. Athanaſius ſent him a letter of thanks for the ſervice which he had performed for the Catholic cauſe, and requeſting a copy of his works, which he either tranſlated himſelf, or cauſed to be tranſlated from the Latin into Greek. On the death of Conſtantius, Lucifer recovered his liberty and came to Antioch, where the Catholics were divided into two parties. Lucifer widened the breach already made, by joining with the opponents of the biſhop of Miletus, who, though a Catholic, was ordained by biſhops ſuſpected of Arianiſm, and had communicated with them, and ordained a Preſbyter among the mal-contents to the epiſcopal office. This ſtep was condemned by his friend, and formerly fellow ſufferer Euſebius, who had been ſent to Antioch by the ſynod of Alexandria, with the view of re-eſtabliſhing the peace of the church. But Lucifer determined to maintain what he had done, and withdrew from the communion of Euſebius, and he formed a party, called after himſelf Luciferians, who reſolved to avoid all commerce or fellowſhip with thoſe biſhops who had declared themſelves in favour of the Arians. With this reſolution he went into Sardinia, and thereby produced a ſchiſm in the church, which at firſt ſpread widely, but did not obtain numerous adherents, and does not appear to have out-lived the century. Lucifer died about the year 370. His works are written in a harſh and barbarous ſtyle. According to Lardner, they conſiſt very much of paſſages of the Old and New Teſtament, cited one after another, which he quotes with marks of the greateſt reſpect. He farther adds, that the works of this prelate have not yet been publiſhed with all the advantage that might be wiſhed. The titles of theſe works are "Ad Conſtantinum Imperatorem, lib. ii.;" "De Regibus Apoſtaticis;" "De non conveniendo cum Hereticis;" "De non parcendo Delinquentibus in Deum;" "Quod moriendum ſit pro Filio Dei;" and "Epiſtola brevis ad Florentium." They were collected together, and publiſhed at Paris by John Till, biſhop of Meaux, in 1568. Gen. Biog. Lardner, vol. iv. edit. 1788. Moreri.

LUCIFERA, in *Mythology*, a ſurname given to Diana, under which title ſhe was invoked by the Greeks in childbed. She was repreſented as covered with a large veil, interſperſed with ſtars, bearing a creſcent on her head, and holding in her hand a lighted flambeau.

LUCIFERIANS, a religious ſect, who adhered to the ſchiſm of Lucifer, biſhop of Cagliari, in the fourth century, who was baniſhed by the emperor Conſtantius, for having defended the Nicene doctrine concerning the three perſons in the Godhead.

St. Auguſtine ſeems to intimate, that they believed the ſoul, which they conſidered as of a carnal nature, to be tranſmitted to the children from their fathers. Theodoret ſays, that Lucifer was the author of a new error. The Luciferians increaſed mightily in Gaul, Spain, Egypt, &c. The occaſion of the ſchiſm was, that Lucifer would not allow any acts he had done to be aboliſhed. There were but two Luciferian biſhops, but a great number of prieſts and deacons. The Luciferians bore a peculiar averſion to the Arians.

LUCILIUS, Caius, in *Biography*, a Roman poet, was born at Sueſſa, in the country of the Aurunci, about the year 148 B.C. He was of a good family, and in the Numantine war bore arms under Scipio Africanus the younger, with whom, and his friend Lælius, he lived in terms of friendſhip. He is looked upon as the founder of ſatire, and as the firſt conſiderable writer of ſatires among the Romans. From Horace, who refers to them ſeveral times in his own ſatires, it appears that he imitated the old Greek comedians in marking out by his cenſure individuals notorious for their vices, even thoſe of the very higheſt rank. Though ſuperior to his poetical predeceſſors at Rome, and though he wrote with great roughneſs and inelegance, he gained many admirers. By Horace he is compared to a river which rolls upon its waters precious ſand, accompanied with mire and dirt. Of his thirty books of verſes only a few ſcattered fragments are come down to modern times. He died at Naples about the year B.C. 103. His fragments have been collected and publiſhed, with notes by Francis Douza, in quarto. They are alſo given in Mattaire's "Corpus Poetarum."

LUCINA, of *lux*, *light*, in *Mythology*, a deity who preſided over the labour of women and the birth of children. This title is ſometimes given to Diana, but moſt commonly to Juno.

LUCIO, St., in *Geography*, a town of Etruria; 14 miles E.S.E. of Leghorn.

LUCIOPERCA, in *Ichthyology*, a ſpecies of *Perca*; which ſee.

LUCIPARA, or Lusipara, in *Geography*, a ſmall barren iſland in the Eaſt Indian ſea, near the S. coaſt of the iſland of Banca. S. lat. 3° 14'. E. long. 106° 20'.

LUCITO, a town of Naples, in the county of Moliſe; 11 miles N.E. of Moliſe.

LUCIUS I., pope, in *Biography*, ſucceeded to the high dignity upon the death of Cornelius in the year 252, and after a ſhort pontificate he is ſuppoſed to have died in March 253. He was baniſhed Rome immediately after his ordination, under the reign of Gallus; but he ſoon returned to the great joy of his flock, who crowded to meet him. St. Cyprian wrote him a letter of congratulation, in which he obſerves, that he was perhaps recalled to be immolated in the ſight of his flock, that they might be encouraged and animated by his Chriſtian conſtancy and reſolution. Cyprian in another place calls him a martyr, nevertheleſs we have no account of the manner of his death, and hence it has been thought that the expreſſion made uſe of by this father is not to be underſtood ſtrictly and literally.

Lucius II. pope, raiſed to that dignity on the death of Celeſtine II. in 1144, was a native of Bologna, who embraced the eccleſiaſtical life among the canons of St. Auguſtine. In 1125 he was created a cardinal, and appointed librarian of the Roman church. After this he was nominated the chancellor, and twice was ſent papal legate into Germany. A ſhort time before the death of Innocent II. the Romans threw off the papal yoke in temporal matters, reſtoring the ſenate, and creating their own magiſtrates, to whom they would yield obedience. In this attempt to recover their ancient liberties, they perſiſted after the election of Lucius, whom they acknowledged for lawful pope, but would not own him for their ſovereign. They contended that it was inconſiſtent with the profeſſion of the clergy, that they ſhould poſſeſs lordſhips, eſtates, and temporal dominion, and that they ought to content themſelves with ſuch decent ſubſiſtence as they might derive from voluntary tythes and oblations. To Lucius, as their biſhop, they paid all due reſpect; but ſoon after his election, they veiled the patrician dignity in one of their own body, and ſubmitted to him as their prince. Lucius took every method to oppoſe their plans; he ſought aſſiſtance from Conrad, king of Germany, and when he was refuſed, he put himſelf at the head of his own troops, and marched againſt the Capitol, where the ſenate was ſitting. His forces were defeated and himſelf wounded with a ſtone, which terminated his life in a few days, after a pontificate of about eleven or twelve months. Some of his letters are extant in the 10th vol. of the Collect. Concil.; and two in the ſecond vol. of Baluze's Miſcel.

Lucius III., pope, a native of Lucca, was educated to the church, and after various degrees of preferment, he was created cardinal by Innocent II. By Adrian IV. he was ſent legate into Sicily; after this pope Alexander III. appointed him legate to the emperor Barbaroſſa, and on the death of Alexander in 1181, he was raiſed to the holy ſee. He was the firſt pope who was elected by the cardinals alone, to the excluſion of the people and clergy, who had hitherto taken a part in the choice of a new pope. Towards the cloſe of the year 1182, a quarrel took place between the pope and the Romans, owing to his refuſal to comply with ſome cuſtoms which had been obſerved by all his predeceſſors. The people broke out into inſurrection, and drove him out of the city, purſuing him from one ſtrong hold to another, till he retired for ſafety to Verona. At firſt he was ably ſupported by the emperor, who ordered Chriſtian, archbiſhop of Mentz, to march in his defence at the head of a powerful army. This prelate ſoon reduced all the ſtrong holds in the neighbourhood of Rome, and ſo haraſſed the Romans, that they were ready to receive the pope on his own terms, when the death of Chriſtian produced a ſudden alteration in the ſtate of affairs; and the Romans, feeling their power, became more determined than ever in their oppoſition. Lucius ſent nuncios to all Chriſtian princes and biſhops to gather contributions; large ſums were gained which he ſpent in bribing the leaders of the oppoſing parties, and then ventured to return to Rome. A ſecond inſurrection drove his holineſs to Anagni, whence he went into Lombardy, to implore the protection of the emperor, who was at that time on his march into Italy, for the purpoſe of holding a council at Verona. In 1184 the council was opened, and the pope preferred his complaints againſt the Romans, painting, in the ſtrongeſt colours, the enormities which they had perpetrated; and they were, without heſitation, declared enemies of the church. To this council is to be traced the origin of the inquiſition againſt heretics. For not only were the Albigenſes condemned and anathematiſed anew, under different names, but all who ſhould admit them into their houſes, ſuffer them in their territories, or afford them any ſort of relief. Under the ſame ſentence were included all thoſe who held or taught different doctrines from thoſe held and taught by the Roman church. Some grounds of diſpute aroſe between the emperor and the pope, as well with reſpect to the reinſtatement of certain biſhops who had been ſuſpended; as alſo on account of the pope's refuſal to crown the emperor's ſon Henry, and to give him the title of emperor. The pope, however, was not willing to proceed to a direct rupture with the emperor, and the buſineſs in diſpute was ſuſpended. In 1184, we find Lucius preſſing, with great earneſtneſs, the Chriſtian princes to ſend powerful ſuccours to the aſſiſtance of their friends and brethren in the Holy Land. While he was promoting, to the utmoſt of his power, a new cruſade, he died at Verona in November 1184, after a pontificate of little more than four years. He is commended for prudence, piety, and unblemiſhed manners. Two of the "Letters," and a "Decree" of this pope's, are to be found in the 10th vol. of the Collect. Concil. Mr. Gibbon, ſpeaking of the 2d and 3d Lucius, ſays, "I cannot forget the ſufferings of two pontiffs of the ſame age, the ſecond and third of the name of Lucius. The former, as he aſcended in battle array to aſſault the Capitol, was ſtruck on the temple by a ſtone, and expired in a few days. The latter was ſeverely wounded in the perſons of his ſervants. In a civil commotion ſeveral of his prieſts had been made priſoners, and the inhuman Romans, reſerving one as a guide for his brethren, put out their eyes, crowned them with ludicrous mitres, mounted them on aſſes with their faces to the tail, and extorted an oath, that in this wretched condition they ſhould offer themſelves as a leſſon to the head of the church." Bower. Moreri. Gibbon, vol. xii.

Lucius, in *Ichthyology*, a ſpecies of *Eſox*; which ſee.

Lucius *Marinus*, the *Sea-pike*, a name given by ſome authors to the fiſh more uſually called the *merlucius*, and in Engliſh the *hake*. See Gadus.

Lucius *Marinus* is alſo uſed by many authors for the *ſudis*, called alſo by ſome *ſphyræna*.

Lucius *Terreſtris*, the *Land-pike*, in *Zoology*, the name of a very ſingular ſpecies of American lizard, which has the ſhape, ſcales, &c. of the pike-fiſh; in the place of the fins of that fiſh it has four legs, but theſe are ſo weak and ſlender that it makes no uſe of them in walking, but crawls along upon the ground in the manner of a ſnake, and draws its legs after it; it grows to about fifteen inches long, with a proportionable thickneſs; it is all over covered with ſmall, ſtrong, and gloſſy ſcales, of a ſilver grey. In the night they retire into holes and caverns, and make a very diſagreeable and loud noiſe, much louder than the croaking of frogs. They ſeldom ſtir out of their holes, unleſs in the duſk of the evening; and if they are ever met with in the day-time, their ſtrange motion ſurpriſes all who ſee them.

LUCKAMPOUR, in *Geography*, a town of Bengal; 70 miles N.W. of Midnapour.

LUCKAU, or Lucca, a town of Lower Luſatia, in a circle of the ſame name, on the river Preſte, containing four churches, a Latin ſchool, and an hoſpital; 49 miles N. of Dreſden. N. lat. 51° 51′. E. long. 13° 40′.

LUCKENS, a town of Sweden, in the province of Drontheim; 25 miles S.S.W. of Drontheim.

LUCKENWALDE, a town and principal place of a circle, in the duchy of Magdeburg; 50 miles E. of Magdeburg. N. lat. 52° 6′. E. long. 13° 3′.

LUCKERCOOT, a town of Hindooſtan, in Guzerat; 30 miles E. of Godra.

LUCKIA, a town of Hindooſtan, in Oude; 40 miles N.E. of Gooracpour.

LUCKIDAUR, a town of Bootan; 40 miles N. of Beyhar, 46 geographical miles in horizontal diſtance from Taſſaſudon. N. lat. 26° 56′.

LUCKIGATCHY, a town of Bengal; 10 miles N.E. of Kiſhenagur.

LUCKINPOUR, a town of Hindooſtan, in the circar of Cicacole; 24 miles N. of Cicacole.—Alſo, a town of Hindooſtan, in Surgooja; 10 miles S.W. of Surgooja.

LUCKIPOUR, a town of Bengal; 40 miles S.E. of Calcutta.—Alſo, a town of Bootan; 55 miles S. of Taſſaſudon.—Alſo, a town of Hindooſtan, in Bengal; 35 miles S.S.W. of Comillah.—Alſo, an iſland in the mouth of the river Ganges, about nine miles long and two broad. N. lat. 22° 27′. E. long. 90° 48′.—Alſo, a town of Bengal, on an iſland of the ſame name; 50 miles S. of Dacca.

LUCKMIPOUR, a town of Hindooſtan, in Bahar; 30 miles E. of Bahar.—Alſo, a town of Bengal; 32 miles S.S.E. of Curruckpour.

LUCKNADANG, a town of Goondwana; 88 miles N. of Nagpour.

LUCKNORE, a town of Hindooſtan, in Bahar; 28 miles S. of Patna. N. lat. 25° 8′. E. long. 85° 16′.

LUCKNOUTI. See Gour.

LUCKNOW, a circar of Hindooſtan, in Oude, bounded on the N. by Kairabad, on the E. by Oude circar, on the S. by Manickpour, and on the W. by Canage; about 75 miles long, and 45 broad. The capital is Lucknow.

Lucknow, a large and populous, but irregular and inelegant, city of Bengal, capital of the fore-mentioned circar, and of the ſubah of Oude, ſituated on the Goomty, which runs on the N. ſide of the town, and is navigable for boats of a common ſize at all ſeaſons of the year; founded by Latſchman, or Lacman, and rebuilt by Bikarmadjit, king of Oude. The ſpot on which the founder reſided is preſerved in remembrance by a moſque, erected for this purpoſe by Aurungzebe. This is a very ancient city, and moderately extenſive; many of the houſes are of brick, but the greateſt part conſiſts of mud walls, covered with tiles, and built on ſcattered eminences, ſo that the aſcents and deſcents are numerous and fatiguing; and the ſtreets are narrow and filthy, no care being taken to preſerve them clean. Moſt of the old palaces were deſtroyed by Suja Dowla, and others erected. The magnificent edifices are few. The houſes of the merchants are conſtructed of brick, and are lofty and ſtrong. Lucknow is diſtant from Allahabad 127 miles; from Agimere 428; from Arcot 1147; from Bahar 388; from Cabul 1118; from Dacca 790; from Dowlatabad 728; from Golconda 794; from Gwalior 211; from Oude or Fyzabad 85; from Patna 316; from Seringapatam 1201; from Viſiapour 920. N. lat. 26° 52′. E. long. 81° 14′.

LUCKO, or Luzk, a city of Ruſſian Poland, capital of the palatinate of Volhynia, with a caſtle, where the biſhop of Volhynia reſided, and where the Jeſuits had a college; it is alſo the reſidence of a Ruſſian biſhop, and has a provincial diet, and court of judicature; 200 miles E.N.E. of Cracow. N. lat. 50° 40′. E. long. 25° 19′.

LUCKOUR, a town of Hindooſtan, in the circar of Sohajepour; 20 miles S. of Sohajepour.

LUCKUMRY, a town of Meckley; 35 miles W. of Munnypour.

LUCO, a town of Naples, in Abruzzo Ultra; nine miles S.S.W. of Celano.

LUÇON, a town of France, and ſee of a biſhop before the revolution, in the department of the Vendée, and chief place of a canton, in the diſtrict of Fontenoy le Comte; 15 miles from it. It is ſituated on a canal, about ſix miles in length, communicating with the ſea. The environs are marſhy, and the air is unwholeſome. The place contains 2630, and the canton 8572 inhabitants, on a territory of 332½ kiliometres, in 10 communes. N. lat. 46° 29′. W. long. 1° 4′.

Luçon, or Luzon, ſometimes called *Manilla*, from its capital, is the largeſt and moſt important of the Philippine iſles, being more than ſeven degrees, or near 500 Britiſh miles in length, and about 100 of medial breadth. This iſland is pervaded in its length by a high chain of mountains towards the eaſt, ſo that its interior parts are difficult of acceſs; and the examination of it is alſo reſtrained by the jealouſy of the Spaniards. It is alſo traverſed by the branches of a conſiderable river, on the banks of which the capital is ſeated; and its lakes are numerous, the largeſt of which is the ſource of the river Manilla. Several volcanoes occur in this iſland, nor are earthquakes uncommon. Its ſoil is uncommonly fertile, and its products are gold, copper, and iron. Such is the fertility of the ſoil, that rice, which in other countries requires much cultivation, grows every where with little or no attention, and even in the higheſt mountains, without being watered. Of rice they have different kinds, ſome of which requires four or five months between the ſowing and the harveſt, and ſome which is ſown and reaped within 40 days. Although they have no wheat but that which is imported, the ſoil is very capable of bearing it, as appeared by an experiment, in which one buſhel produced 130. The graſs grows, the trees bud, bloſſom, and bear fruit all the year, not only in the gardens but on the mountains. The richeſt fruits of the Weſt Indies, as well as of the Eaſt, are here abundant, and ſome that are found no where elſe. Here are 40 different ſorts of palms, the moſt excellent cocoas and caſſia, the ſugar-cane and cotton of peculiar beauty. In the mountains are found wild cinnamon, wild nutmegs, ebony, ſandal wood, together with excellent timber for building and ſhipping. Gold is found upon the mountains in every part of the iſland, waſhed out of the earth by the heavy rains; in the mould of their vallies, carried down by their rivulets; and in the ſand and mud of their lakes, brooks, and rivers. The Spaniards obtain about 1000 or 1500 pounds weight every year, as a tribute of the inhabitants. All kinds of cattle abound, ſo that a large fat ox does not coſt above four pieces of eight. Civet-cats are alſo very common, and their civet is highly valuable. Ambergris is alſo thrown on their coaſts in prodigious quantities. The natives, who are of a mild character, are called Tagals, like all thoſe of the Philippines, and ſeem to be of Malay origin. They are tall and well made, wearing only a kind of ſhirt, with looſe drawers; but the dreſs of the women is chiefly a large mantle, and their black and beautiful hair ſometimes reaches the ground; their complexion is a deep tawny. Their houſes are of bamboo covered with palm leaves, raiſed on pillars to the height of eight or ten feet. The chief food is rice, which is often eaten with ſalted fiſh. M. Sonnerat has given ſome account of the interior part of the country, as far as he was able to penetrate it. At the diſtance of about a day's journey from the capital, he found himſelf buried in woods, no habitation nor appearance of cultivation preſenting themſelves to his view. Some ſcattered Indians, having their ſhoulders covered with the ſkins of wild goats, the reſt of the body being naked, with a bow in their hands and arrows on their back, were diſcovered. Their looks were haggard, and their countenances very unprepoſſeſſing. They ſeemed to be timid and diſpoſed to flee from the face of man, and even from one another. They have no ſociety; they are ſolitary wanderers; ſtopping when night overtakes them, and ſleeping in the hollows of trees. They have no families, and they ſeem to be conſtrained merely by inſtinct to ſue the females whom chance has thrown in their way. After traverſing the wood above-mentioned, M. Sonnerat was led to a large lake, in the middle of which is an iſland, where ſome Indian families have taken refuge; here they live by fiſhing, and preſerve their liberty, ſuffering no one to land on the place, which ſerves them for an aſylum. On the E.S.E. the lake is bounded by high mountains; the ſoil is fertile, and there are many fruit trees; and hence Manilla is ſupplied with fruit. Theſe mountains are inhabited by a mild ſet of people, who employ themſelves in making mats, cloth, and different works with the abacca, a kind of banana which bears no fruit, and of which the filaments are very ſtrong. Theſe people have laws, and puniſh crimes, the chief, in their eſtimation, being adultery. On the other ſide of the mountains, which bound the lake on the E.S.E., are immenſe plains, traverſed by large and deep rivers, which diffuſe fertility. Here are a few ſcattered villages inhabited by men, without morals, without virtue, without equity;

who fear each other, and having no protection from laws, truſt to the force of arms alone for their ſafety. In a word, they live in perpetual diſtruſt and dread of one another. Nevertheleſs, ſays our traveller, the arts have reduced this ſavage nation, without ſoftening their ferocious manners. Columba was the name of one of the largeſt villages poſſeſſed by this ſavage tribe; and on the day of his arrival the people had a grand feſtival, which they celebrated with divers ſpectacles. Part of theſe ſpectacles was the exhibition of a tragedy, and this was preceded by a cock-fight, and by other games, at which large ſums were won and loſt. Two leagues from Columba, in a village of leſs extent, was a rivulet, whoſe water was hot and boiling; and yet on the banks of this rivulet were vigorous ſhrubs; one of theſe ſhrubs was an "agnus caſtus," and the two others "aſpalatus." The Spaniſh governor, conceiving that theſe waters poſſeſs ſome good qualities, has conſtructed near them ſeveral baths. Fiſh were found ſwimming in this water, the heat of which was ſo great, that our author could not touch it. In the interior of the country, he ſays, there are many nations, which the Spaniards have in vain endeavoured to ſubdue. No force is ſufficient to ſubjugate them; but they fly to a diſtant aſylum, and there it is ſaid they ſwear an implacable hatred againſt the oppreſſors of their country, meditating and preparing means of vengeance. From thence they iſſue in mean boats; but fortified by courage, and animated by hatred, they dare to approach the gates of the capital. Their incurſions are a ſucceſſion of pillages, murders, ravages, and rapes. On leaving the village, traverſed by the rivulet of hot water, our author took an eaſterly route, and after three hours' journey, found himſelf in an immenſe plain, which was watered and rendered fertile by a rivulet of clear, light, and wholeſome water, that deſcended from the top of a neighbouring mountain. Large meadows were enamelled with flowers, whoſe variety of colour and perfume delighted equally the ſight and the ſmell. The inhabitants were friendly and hoſpitable.

In ſome provinces of this iſland there are Pintadoes, that is, painted negroes, whoſe perſons are tall, ſtraight, ſtrong, and active, and diſpoſition excellent; and to the blacks, ſuch as we have deſcribed, who live in the mountains and thick-woods, the Spaniards have given the name of Negrilloes; they are a rude and barbarous people. In the mountains, near ſprings, and in caves pleaſantly ſituated, there is a nation called the Ilayas, or Tinghianos, who, as ſome ſuppoſe, are deſcended from the Japaneſe, as free as the Negrilloes, but differing from them in diſpoſition and character; for they are not only very brave, but very courteous and humane. This iſland is divided into provinces, moſt of which are under the juriſdiction of the Spaniards. The principal are the Balayan, in which are 2500 tributary Indians; in that of Camarinas is the city of New Caceres, the ſee of a biſhop. Paracale contains 7000 Indians, who pay tribute to Spain; this province abounds in mines of gold and other metals, and of valuable load-ſtones. In Cagayan are 9000 tributaries; but the richeſt and moſt populous province is ſaid to be that of Illocos, whoſe coaſt extends upwards of 90 miles. There are ſeveral others, ſuch as Pangaſian, Bahi, Balacan, &c. N. lat. 12° 48′ to 18° 48′. E. long. 120° 6′ to 124° 10′. See Manilla.

LUCOTTA, a ſmall iſland in the Eaſt Indian ſea, near the W. coaſt of Sumatra. N. lat. 1° 43′. E. long. 97° 25′.

LUCRETIA, in *Biography*, a diſtinguiſhed Roman lady, was the wife of Collatinus, a relation of Tarquin, king of Rome. Her accompliſhments proved fatal to her; and the praiſes which a number of young nobles at Ardea, who were attached to the Roman army, among whom were Collatinus and the ſons of Tarquin, beſtowed upon the domeſtic virtues of their wives at home was, in truth, productive of a revolution in the ſtate. While each was warm with wine, it was agreed that they ſhould inſtantly take their horſes, and go to Rome to aſcertain the fact how the wife of each was employed. The ladies of the Tarquins were found paſſing the night with their friends and relatives at a banquet, but Lucretia was employed in the midſt of her female ſervants, and ſharing their domeſtic labours. The beauty and innocence of Lucretia, who received her huſband and the young princes with the moſt exquiſite female grace, made ſuch an impreſſion upon Sextus Tarquinius, that he reſolved, at whatever expence, to gratify the guilty and infamous paſſion which he had conceived. In a few days after, he left the camp in ſecrecy, and came to the houſe of Lucretia, who entertained and lodged him with a noble and unſuſpecting hoſpitality; but, in return for her kindneſs, in the dead of the night he introduced himſelf to the virtuous lady, who refuſed to his intreaties, what her fear and ſhame granted to his ſavage threats. She ſubmitted to the cruel wretch, whom he not only, with a drawn ſword, threatened to murder, but to blaſt alſo her reputation, by killing one of her ſlaves, and putting him in her bed, that an apparent criminal connection might ſeem to have met with its deſerved puniſhment. Tarquin left her in triumph, but his exultations were ſhort-lived; ſhe, who had loſt her honour, had nothing left in life of any value: ſhe aſſembled, in the morning, her huſband, her father, and neareſt relatives, revealed to them the indignities ſhe had ſuffered, entreating them to avenge her wrongs, at the ſame time declaring that ſhe was reſolved to expiate her own fault by a voluntary death. To their intreaties, their arguments, and remonſtrances, ſhe turned a deaf ear, and while they were inventing new reaſons why ſhe ought to live to bear teſtimony againſt the monſter, ſhe drew a dagger that ſhe had concealed for the purpoſe, and plunged it into her heart. Hiſtorians have given the accounts ſomewhat different; our account is that of Livy, but all agree that the melancholy cataſtrophe was the immediate cauſe of the expulſion of the Tarquins, and the change of the Roman form of government.

LUCRETIUS, Titus Carus, a celebrated Roman poet and philoſopher, born about the year 96 B.C., was ſent at an early age to Athens, where he is ſaid to have ſtudied under Zeno and Phædrus. Here he imbibed the philoſophical tenets of Epicurus and Empedocles, which, at that period, prevailed at the great ſeat of Greek learning: theſe and other doctrines, popular among the literati, he afterwards explained and elucidated in his celebrated work, entitled "De Rerum Natura;" it contains, in fact, the firſt complete and accurate ſtatement of the Epicurean philoſophy in the Latin language. In this poem the writer has controverted all the popular notions of heatheniſm, and even thoſe points which are fundamental in every ſyſtem of religious faith, the exiſtence of a firſt cauſe, by whoſe power all things were and are created, and by whoſe providence they are ſupported and governed. Nevertheleſs, the maſterly genius and unaffected elegance of the poet are every where conſpicuous; his language and verſification ſometimes partake of the rudeneſs of an early period of literature, and in the argumentative parts of his work, the poet is frequently difficult to be underſtood; but where the ſubject admits of elevated ſentiment and deſcriptive beauty, no Roman poet has taken a loftier flight, or exhibited more ſpirit and ſublimity; the ſame animated ſtrain is ſupported almoſt throughout

out entire books. Virgil ſtudied him, and has borrowed much of his diction. This poem was written and finiſhed while the poet laboured under a violent delirium, occaſioned by a philtre, which the jealouſy of his miſtreſs or his wife had adminiſtered. The morality of Lucretius is generally pure, but many of his deſcriptions are licentious. The abſurdities and impiety of his philoſophy cannot in this country, and in this age, be accounted dangerous; and perſons of high integrity and the greateſt reſpectability have become, in modern times, the editors and commentators of Lucretius's poem. The beſt editions are thoſe of Creech, 8vo. 1695, Oxon.; of Havercamp, Lugd. B. 4to. 1725, and of the celebrated Gilbert Wakefield, Lond. 3 vols. 4to. The laſt is exceedingly rare, on account of the fire which deſtroyed the greater part of the impreſſion. Mr. Good, the tranſlator of the poem, and whoſe work was publiſhed in 1805, has taken advantage of this circumſtance, and has given the entire text from Mr. Wakefield's edition, which had been collated and printed with the utmoſt care by that learned and much to-be-lamented claſſical ſcholar. In the tranſlation juſt referred to, there are, beſides elaborate annotations, a critical account of the principal editions and tranſlations of his author, a hiſtory of the poet, a vindication of his character and philoſophy from vulgar miſrepreſentation, and a comparative ſtatement of the rival ſyſtems of philoſophy that flouriſhed in the time of Lucretius. In this poem the tranſlator imagines he has diſcovered the inductive method of the illuſtrious Bacon; part of the ſublime phyſics of ſir I. Newton, and various chemical diſcoveries of our own days, in a ſurprizing degree anticipated, as to their principles and many important reſults.

LUCRINO, in *Geography*, a lake near Naples, anciently celebrated for its green oyſters and other fiſh, ſeparated from the ſea by an artificial bank. In the year 1538, an earthquake formed a mountain near two miles in circumference, and 200 feet in height; conſiſting of lava, burned ſtones, ſcoria, &c. which left no appearance of a lake, but a moraſs filled with graſs and ruſhes.

LUCULLEUM MARMOR, in the *Natural Hiſtory of the Ancients*, the name of a hard ſtony kind of marble, of a good fine black, and capable of an elegant poliſh, but little regarded from its want of variegations. When freſh broken, it is ſeen to be full of ſmall, but very bright ſhining particles, appearing like ſo many ſmall ſpangles of talc. It had its name from the Roman conſul Lucullus, who firſt brought it into uſe in that city. It is common in Italy, Germany, and France. We have much of it imported, and our artificers call it the *Namur* marble, the Spaniards call it marble of *Buga*.

LUCULLIAN GAMES, in *Antiquity*, were annual games decreed by the province of Aſia, about the year 70 before Chriſt, in honour of the exploits of Lucullus.

LUCULLUS, LUCIUS LICINIUS, in *Biography*, a Roman commander, who has been celebrated for his fondneſs for luxury, as well as for his military talents, was born about the year 115 before the Chriſtian era, and being well educated, he ſoon diſtinguiſhed himſelf by his proficiency in the liberal arts, particularly in eloquence and philoſophy. As a military man, he was firſt noticed with applauſe in the Marſian war, and was, on account of his good conduct, made an edile. He was employed by Sylla in many important concerns, and during the ſiege of Athens was ſent by that commander into Egypt and Lybia, to procure a ſupply of ſhips. With reſpect to king Ptolemy he was unſucceſsful, but he pleaded the cauſe of his employer with more effect in other places, and collected a fleet, with which he gave two defeats to that of Mithridates, and convoyed Sylla's troops from the Thracian Cherſoneſus. After the peace he was appointed quæſtor in Aſia, and prætor in Africa, in which offices he rendered himſelf illuſtrious by his love of juſtice, moderation, and humanity. He was raiſed to the conſulſhip when he was about forty years of age, and entruſted with the care of the Mithridatic war; his firſt proweſs was conſpicuous in reſcuing his colleague Cotta, whom the enemy had beſieged in Chalcedonia. This was ſoon followed by a celebrated victory over the forces of Mithridates, on the borders of the Granicus, and by the conqueſt of all Bithynia. His victories by ſea were as great as thoſe by land, and Mithridates was driven with great loſs towards Armenia, to the court of Tigranes, his father-in-law. His flight was quickly diſcovered, and Lucullus croſſed the Euphrates, and gave battle to the vaſt army which Tigranes had aſſembled to ſupport the cauſe of his ſon. It is not eaſy to give entire credit to the account of the numbers ſaid to have been ſlain on this occaſion, but the ſlaughter muſt have been prodigious, when Plutarch eſtimates that not leſs than 100,000 foot, and 55,000 horſe ſoldiers loſt their lives in this battle; and this at the expence of a very few Roman lives. Lucullus is repreſented by Plutarch as having paid much attention to dreams and auguries, yet he certainly exhibited, at the ſame time, an avowed contempt of vulgar ſuperſtition, for being admoniſhed by ſome of his officers not to give battle on that day, being the anniverſary of a great defeat ſuſtained by the Romans from the Cimbri, he replied to the monitor, "I alſo will make this a day to be remembered by after-ages." The taking of Tigranocerta, the capital of Armenia, was the conſequence of the victory, and Lucullus there obtained the greater part of the royal treaſures. This continued ſucceſs rendered the commander haughty and imperious, and his changed manners were offenſive to the ſoldiers, and diſpleaſing to thoſe who adhered to the cauſe of Rome. He was accuſed in the ſenate with deſignedly protracting the war for his own emolument, and diſcontents proceeded ſo far that he was ſuperſeded, firſt by the conſul Glabrio; after which Pompey was ſent to ſucceed him, and to continue the Mithridatic war. His interview with Lucullus began with acts of mutual kindneſs, and ended in the moſt determined enmity. Lucullus was however permitted to retire to Rome, and 1600 ſoldiers, who had ſhared his fortune and his glories, were allowed to accompany him. At Rome he was coldly received, and he obtained with difficulty a triumph which was claimed by his fame, his ſucceſſes, and his victories. This was the termination of his military glory, he retired to the enjoyment of eaſe and peaceful ſociety, and no longer intereſted himſelf in the commotions which diſturbed the tranquillity of Rome. He now adopted a life of luxurious profuſion, ſcarcely parallelled by a private citizen in any age or country, but under the direction of a refined taſte, and not excluding the rational pleaſures of literature. He collected a ſplendid library, which he threw open to all perſons of learning and curioſity. It was particularly the reſort of the Greeks who viſited Rome, and whom he treated with great hoſpitality, delighting to converſe with them on topics of philoſophy, with all the doctrines and ſects of which he was thoroughly converſant. He was himſelf principally attached to the doctrines of the old academy, the defence of which is put into his mouth by Cicero, in a dialogue entitled "Lucullus." Toward the cloſe of his life, Lucullus fell into a delirium, and he died in about the ſixty-eighth year of his age, and was much regretted by the Roman people, who doubtleſs had taſted the fruits of his munificence: they would willingly have given him an honourable funeral in the Campus Martius, but their offers were rejected, and he was privately buried by his brother at Tuſculum. Lucullus has been admired for his many accompliſhments, but he has been cenſured for his ſeverity and extravagance. The expences of his table were immoderate; his halls were diſtinguiſhed by the different names of the gods, and when Cicero and Pompey attempted to ſurpriſe him, they were aſtoniſhed at the coſtlineſs of a ſupper which had been prepared upon the word of Lucullus, who had merely ſaid to his ſervant that he would ſup in the hall Apollo. In his retirement Lucullus was fond of artificial variety; ſubterraneous caves and paſſages were dug under the hills on the coaſt of Campania, and the ſea-water was conveyed round the houſe and pleaſure-grounds, where the fiſhes flocked in ſuch abundance, that at his death they were ſold for a very large ſum of money. Lucullus may rank among the great men of Rome, both for his civil and military qualifications. He was alſo eſtimable in many points of moral character; he was generous, humane, mild, and equitable. He was a perfect maſter of the Greek and Latin languages, and employed himſelf ſome time in compoſing a conciſe hiſtory of the Marſi in Greek hexameters. Such are the characteriſtics of a man who meditated the conqueſt of Parthia, and who might have diſputed the empire of the world with a Cæſar or Pompey, if his fondneſs for retirement had not withdrawn him from the reach of ambition.

LUCUMA, in *Botany*, the Peruvian name of the Linnæan *Achras mammoſa*, which Juſſieu has ſeparated, under this appellation, as a diſtinct genus; chiefly, as it appears, on account of the flowers being pentandrous and five-cleft, and the corolla globoſe rather than bell-ſhaped. The ſeeds moreover are round or angular, not of that elliptical compreſſed form, with the peculiar long ſcar of attachment, which characterizes *Achras*; ſee that article. See alſo Juſſ. 152, and *Sapota Achras*, Gærtn. t. 104.

LUCY-le-Bois, in *Geography*, a town of France, in the department of the Yonne, and chief place of a canton, in the diſtrict of Avallon. The place contains 830, and the canton 7886 inhabitants, on a territory of 242½ kiliometres, in 16 communes.

LUCZAY, a town of Lithuania, in the palatinate of Wilna; 16 miles S. of Breſlaw.

LUCZYNCZ, a town of Poland, in the palatinate of Braclaw; 48 miles W.S.W. of Braclaw.

LUDAIA, a town and diſtrict of the iſland of Java, near the S. coaſt.

LUDAMAR, a Mooriſh country of Africa, bounded on the N. by the Great Deſert, on the E. by Bambarra and Beeroa, on the S. by Kaarta, and on the W. by Jaffnoo. It is governed by a Mahometan prince. The country is not fertile; the principal article of trade is ſalt, which they procure from the Great Deſert, and exchange for ſlaves, to be diſpoſed of to the Europeans. The capital is Benowm, or Benown. N. lat. 15° to 16°. W. long. 5° to 8°. The Moors of this, and the other ſtates adjoining the country of the negroes, reſemble in their perſons the Mulattoes of the Weſt Indies, to ſo great a degree as not eaſily to be diſtinguiſhed from them; and in reality, the preſent generation ſeems to be a mixed race between the Moors (properly ſo called) of the north, and the Africans of the ſouth; poſſeſſing many of the worſt qualities of both nations. By theſe Moors Mr. Park was taken captive, and confined for ſome weeks at Benowm. See Moors.

LUDDINGHAUSEN, a town of Germany, in the biſhopric of Munſter, on the Stever; 12 miles S.S.W. of Munſter. N. lat. 51° 45'. E. long. 7° 36'.

LUDE, Le, a town of France, in the department of the Sarthe, and chief place of a canton, in the diſtrict of La Flèche. The place contains 3018, and the canton 10,376 inhabitants, on a territory of 237½ kiliometres, in 10 communes.

LUDENSCHEDE, a town of Germany, in the county of Mark, the principal trade of which conſiſts in the manufacture of iron; 28 miles N.E. of Cologne. N. lat. 51° 8'. E. long. 7° 42'.

LUDER, a town of Germany, in the biſhopric of Fulda, the ſeat of a juriſdiction; ſix miles W.N.W. of Fulda.

LUDGERSHALL, or Luggershall, a market and borough town in the hundred of Ameſbury and county of Wilts, England. In the year 1800 this place contained 109 houſes, and 471 inhabitants, moſt of whom are employed in agricultural purſuits. Ludgerſhall is a borough by preſcription, and ſent members to all the parliaments in the reign of Edward I. The returns were afterwards irregular, till the ninth year of Henry V., ſince which time it has continued to be repreſented by two members. Like the generality of ſmall boroughs, this has occaſioned ſome parliamentary inveſtigation, and inſtances of bribery and corruption have been proved againſt its members. About ſeventy perſons, who are freeholders, or leaſe-holders, in the borough, have the privilege of voting. The principal object of curioſity, or hiſtorical intereſt, in this town, is its caſtle; a ſmall fragment of which only remains. According to a legendary account, but which is not entitled to much credit, this fortreſs was erected by king Lud, and thence obtained the name of Lud-gars-hall. Stow, in his Annals, relates that Richard I. gave this caſtle, with another at Marlborough, in the ſame county, to his brother John, in the firſt year of his reign. Gough, in his additions to Camden's Britannia, ſtates that it belonged to "Geofrey Fitz-Piers, the wealthy chief-juſtice of England, and earl of Eſſex." It was poſſeſſed by this family till the reign of Henry III., when Jollan de Nevill was appointed its governor. In the reign of Edward III. the manor, caſtle, &c. were veſted in John, lord Molins, who obtained a grant from that monarch to impark the woods with 100 acres adjoining. See Groſe's Antiquities of England, and Britton's Beauties of Wiltſhire, vol. ii. p. 156, &c. Weſt of this town is Chidbury, or Shidbury hill, ſaid to be the higheſt eminence in Saliſbury plain. Its ſummit is incloſed with an entrenchment, which is deep, and which Aubrey attributes to the Britons. From the top, a ditch extends down the northern ſlope, and terminates at the bottom, where the inequality of the ground ſhews that a permanent encampment, or town formerly exiſted. The open downs in this part of the county abound with barrows, or tumuli of various ſizes, and encampments. See Stukeley's Account of Stonehenge, and Hoare's Ancient Wiltſhire.

LUDHANA, a town of Hindooſtan, in the circar of Sirhind, on the Setledge; 18 miles N.W. of Sirhind. N. lat. 30° 2'. E. long. 74° 57'.

LUDHOA, a town of Sweden, in Eaſt Bothnia; 36 miles S.E. of Braheſtad.

LUDI Circenses. See Circenses.

Ludi *Cereales*. See Cereales.

Ludi *Florales*. See Florales.

Ludi *Juveniles*. See December.

Ludi *Trojans*. See Trojani.

LUDIA, in *Botany*, from *ludo*, to ſport. The name was given by Commerſon, as Juſſieu informs us, becauſe nature, to uſe a common expreſſion, *ſports* remarkably in the ſhape of the leaves; which in the young ſhrub are minute, with ſpinous teeth, but in the adult one much larger, and entire.—Juſſ. 343. Lamarck Dict. v. 3. 612. Illuſtr. t. 466 Willd. Sp. Pl. v. 2. 1129.—Claſs and order, *Polyandria Monogynia*. Nat. Ord. *Roſaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in from four to ſeven deep, nearly equal, roundiſh, ſpreading, fringed ſegments, permanent. *Cor.* none. *Stam.* Filaments numerous, thread-ſhaped, inſerted into the receptacle, twice or thrice the length of the calyx; anthers roundiſh, of two lobes. *Piſt.* Germen ſuperior, ſeſſile, ovate; ſtyle columnar, ſcarcely ſo long as the ſtamens; ſtigma obtuſe, three or four-cleft, more or leſs deeply. *Peric.* Berry dry, globoſe, tipped with the permanent ſtyle, and ſtanding on the reflexed, deformed, permanent calyx, of one cell. *Seeds* numerous, ſomewhat angular.

Eſſ. Ch. Calyx in ſeveral deep ſegments. Corolla none. Stigma three or four-cleft. Berry dry, ſuperior, of one cell, with many ſeeds.

Obſ. This genus is evidently moſt nearly allied to *Prockia*, and wherever the latter is placed, in a natural or artificial ſyſtem, this muſt go along with it. Both ſeem to belong to the *Icoſandria*, but they have been univerſally claſſed in *Polyandria*. Jacquin indeed aſſerts that the ſtamens of his *Ludia tuberculata* are inſerted into the receptacle; but, on the other hand, the *Prockia integrifolia*, Willd. Sp. Pl. v. 2. 1214, is as truly icoſandrous as the ſtrawberry or any other plant can poſſibly be, though Lamarck's figure, t. 465. f. 2, does not expreſs it. He has, moreover, made the ſerratures of the leaves too ſtrong, they being very ſhallow in the original.

1. L. *heterophylla*. Lamarck n. 1. t. 466. f. 1, 2.—Leaves of the adult ſhrub obovate, coriaceous, ſhining; of the young one ſharply toothed. Stigma ſlightly notched.—Gathered by Commerſon in the iſland of Mauritius, where it is called *Bois ſans ecorce*, or tree without bark. Lamarck deſcribes and figures the young ſhrub with ſmall roundiſh *leaves*, furniſhed with ſtrong ſpinous teeth, ſomewhat like *Quercus coccifera*, or *Malpighia coccifera*. Juſſieu alſo relates the ſame. We have ſeen no ſpecimens in this ſtate. Our's is an adult one, with coriaceous, obovate, obtuſe or emarginate, entire, alternate *leaves*, an inch or an inch and half long, broad, veiny, and ſhining, paler beneath, on ſtrong footſtalks, half an inch in length; ſee Lamarck's fig. 1. We find no *ſtipulas*. The *flowers* are axillary, ſolitary or in pairs, on ſhort, thick, ſcarred ſtalks, with numerous, minute, imbricated, roundiſh concave *bracteas* at the baſe of the ſtalks. The *calyx* is green, finely downy. *Stamens* long and ſlender. *Style* ſhort, erect and thick, with a ſlightly notched, very little enlarged, *ſtigma*.

2. L. *myrtifolia*. Lamarck n. 2. t. 466. f. 3.—Leaves ovate, nearly entire. Style ſomewhat curved. Stigma with three notches.—Native of the iſle of Bourbon.—This is what Juſſieu intends when he ſays the *leaves* of the increaſing ſhrub (in *Ludia*) are like myrtle or box, and entire; as however the ſpecimens are in flower, Lamarck judged them to be arrived at perfection, and a diſtinct ſpecies from the above; eſpecially as the *ſtyle* is ſomewhat incurved, and the *ſtigma* has only three notches, inſtead of four. We are totally unable to form any decided opinion on the ſubject. The *leaves* of the preſent plant are much ſmaller, thinner, and generally more pointed than in the former; but we perceive here and there among them rudiments of teeth, and minute ſpines, as if they were in a progreſſive ſtate from one ſhape to the other. Neither are the differences indicated in the *ſtyle* and *ſtigma* very ſtriking or decided. We are therefore moſt inclined to adopt the opinion of Juſſieu, that the preſent is only the advancing, or firſt-flowering, ſtate of the above very extraordinary ſpecies. We have moreover a ſpecimen, gathered by Commerſon in Madagaſcar, which is evidently intermediate in the form, margin, and texture of its leaves, betwixt this *myrtifolia* and the adult *heterophylla*.

3. L. *ſeſſiliflora*. Lamarck n. 3. (L. tuberculata; Jacq. Hort Schoenbr. v. 1. 59. t. 112.)—Leaves elliptic-lanceolate. Stigma deeply three-cleft.—Native of the iſland of Mauritius. It flowered under Jacquin's obſervation, in the ſtove at Schoenbrun, in June and July, and formed imperfect fruit, which he thought did not agree with Juſſieu's character, and which Willdenow has, from his figure, deſcribed as being, in this ſpecies, a berry of three cells, with ſolitary ſeeds. But we preſume nothing can be judged from ſuch an abortion. We ſhould have preferred Jacquin's ſpecific name to Lamarck's, as the flowers are rarely ſeſſile, had it not been equally applicable to both the former. This is a ſmall *tree*, with drooping, ſubdivided branches. *Leaves* ſcattered, ſtalked, more or leſs elliptical, but rather irregular in ſhape, coriaceous, veiny, ſmooth and ſhining, both ſides nearly of the ſame hue. *Flowers* axillary, ſolitary; in our ſpecimen nearly as much ſtalked as in the above. *Calyx* all over very downy. *Germen* large, and rather elevated. *Style* divided, almoſt half way down, into three blunt cloven ſtigmas.

LUDITZ, in *Geography*, a town of Bohemia, in the circle of Saatz.

LUDLOW, EDMUND, in *Biography*, a diſtinguiſhed leader of the republican party in the civil wars of Charles I., ſon of ſir Henry Ludlow, knight, was born about the year 1620, and received his academical education at Trinity college, Oxford, whence he removed to the Temple to ſtudy the laws and conſtitution of his country. His father was repreſentative for Wiltſhire in the Long parliament of 1640, and having joined the party in oppoſition to the court meaſures, Edmund adopted the ſame principles, and entered into a military aſſociation among the ſtudents of law, with whom he joined the army as one of the life-guards of the earl of Eſſex. In this ſituation he was preſent at the battle of Edgehill, in which it appears that he endured much perſonal fatigue and ſuffering. Speaking of the night after the battle, he ſays, "No man nor horſe got any meat that night, and I had touched none ſince the Saturday before; (this was Monday,) neither could I find my ſervant, who had my cloak, ſo that having nothing to keep me warm but a ſuit of iron, I was obliged to walk about all night, which proved very cold by reaſon of a ſharp froſt." And he farther adds, "when I got meat, I could ſcarcely eat it, my jaws, for want of uſe, having loſt almoſt their natural faculty." Soon after this, Ludlow raiſed a troop of horſe, which he commanded at the ſiege of Wardour caſtle. Of this fortreſs, when taken, he was made governor, and he held it ten months againſt all the efforts of the king's party, till it was battered to ruins. He was taken priſoner on its ſurrender, but was ſoon exchanged, and then appointed by the parliament ſheriff of the county of Wilts. He took a commiſſion under ſir William Waller, was preſent at the ſecond battle of Newbury, and at ſeveral other important actions, in which he diſplayed equal valour and good conduct. When the leaders of the preſbyterian party were thrown out of power by the ſelf-denying ordinance, Ludlow ſeceded with them, and remained without public employment till he was choſen, in 1645, knight of the ſhire for the county of Wilts, in the place of his father, who died two years before. At this period the plans of Cromwell began to be developed, and Ludlow was one of thoſe who oppoſed them with the greateſt firmneſs and openneſs. He appears to have acted with principle, and his meaſures were all the reſult of integrity and honour. He was one of the king's judges, and ſoon after that event, Cromwell, to keep him out of the way, cauſed him to be nominated lieutenant-general of horſe in Ireland, and one of the commiſſioners for civil affairs. After the death of Ireton, the chief command of the army devolved on Ludlow, but as he continued to oppoſe the ambitious projects of the protector, he was, in a very ſhort time, ſuperſeded. He was afterwards impriſoned, but being admitted into the preſence of Cromwell, he vindicated his own conduct and the republican principles on which he acted with great freedom and preſence of mind, and could not, by any means, be induced to make any engagement for future ſubmiſſion. When Richard was declared protector, Ludlow, with other republicans, joined the army party of Wallingford-houſe, and was inſtrumental in the reſtoration of the Long parliament, in which he took his former ſeat; was appointed one of the committee of ſafety, and had likewiſe the command of a regiment. He was again ſent to Ireland as commander-in-chief of the forces there, and his firſt care was to fix the officers in the intereſt of parliament. When he found things taking a decided turn towards monarchy, he haſtened to London with a view of preventing this change, and when he found the effort hopeleſs, and that the tide of public inclination in favour of a king was irreſiſtible, he began to conſider of his own ſafety. His name was not among the ſeven excepted in the bill of indemnity; nevertheleſs, the proclamation reſpecting the perſons who ſat in judgment on the late king Charles filled him with juſt apprehenſion, and notwithſtanding the remonſtrances of his friends to the contrary, he determined, as his ſafeſt courſe, to withdraw from the kingdom. He landed at Dieppe in 1660, whence he proceeded to Geneva, where he was joined by two other perſons who had likewiſe been judges of the late king, but thinking themſelves not ſufficiently ſecure they withdrew into Switzerland. Even here, the vengeance of the royal family purſued the regicides, ſome of whom were actually aſſaſſinated by the agents of the Engliſh government; an attempt was made againſt the life of Ludlow, but being diſcovered, he evaded the blow, and paſſed the remainder of his life in the neighbourhood of Berne, highly reſpected and eſteemed by the magiſtrates and people of that city, as well for his private virtues as his public character. In 1689 he ventured to come over to England, and appear openly in London; but a motion being made in the houſe of commons for an addreſs to the king to iſſue a proclamation for his apprehenſion, he returned to the continent, and cloſed his life in exile, at the age of ſeventy-three. A monument was erected to his memory, in the principal church at Vevay, by his widow, who had been the faithful and courageous partner in all his fortunes. Edmund Ludlow was undoubtedly one of the pureſt and moſt diſintereſted perſons who flouriſhed in thoſe times. He was equitable and humane, calm and ſedate, yet reſolute; virtuous without auſterity, and pious without fanaticiſm. His "Memoirs" were firſt printed at Vevay, in two vols. 8vo. 1698, to which, in the following year, another volume was added. They were reprinted in one volume folio, London 1751; to this edition was added "The Caſe of king Charles I.," drawn up by John Cook, ſolicitor to the high court of juſtice on his trial. In the ſame year, the work was printed in three vols. 12mo. at Edinburgh. An edition in 4to. was publiſhed in 1771. The "Memoirs" contain an account of the author's own tranſactions during the civil wars, and the ſubſequent period, together with many particulars relative to the general hiſtory of the times, written in a clear, intereſting, and unaffected ſtyle. Biog. Brit. Ludlow's Memoirs, three vols. 12mo.

Ludlow, in *Geography*, a market-town, ſituated in the hundred of Munſlow, and county of Salop, England. It ſtands on an eminence at the junction of the rivers Teme and Corve, in a fertile and pictureſque diſtrict, and commands a variety of beautiful proſpects. The ancient Britiſh name of this place was *Dinan Llys Tywſog*, or the *Prince's Palace*. Hence it is ſuppoſed to have been the reſidence of ſome prince of the country, prior to the ſubjection of Wales by Edward I. This town extends about a mile in length, and in its broadeſt part is ſomewhat more than half a mile in that direction. It was formerly ſurrounded by a wall, ſome part of which is ſtill ſtanding, but in a ſtate of great dilapidation. Towers were placed at certain diſtances, and there were formerly ſeven gates, of which only one now remains. The ſtreets are moſtly wide, and well paved, and lie in a diverging and inclined direction from the higheſt, or central part of the town. The houſes, in general, preſent rather an elegant appearance, and are more regularly diſpoſed than in moſt inland towns of the ſame antiquity. They are chiefly occupied by families of independent fortune, who are attracted by the healthful ſituation of the place. Gloves conſtitute the principal manufacture, beſides which, however, there is a conſiderable trade in the tanning, timber, and cabinet making lines. A number of perſons are likewiſe employed in the various branches of mechaniſm. There are four markets during the week, but the moſt important one is held on Monday, and is well ſupplied with every article neceſſary for the ſupport of man.

Ludlow, according to the parliamentary returns of 1801, contained 804 houſes, and 3897 inhabitants. It was incorporated by charter in the reign of Edward IV. The government is now veſted in a recorder, two bailiffs, two capital juſtices, twelve aldermen, twenty-five common councilmen, a town clerk, a coroner, and ſeveral other inferior officers. The election of the bailiffs is uſually attended with a degree of magnificence and ſplendour far ſurpaſſing the ſame ceremony in other towns of ſimilar extent. The quarter-ſeſſions are held here before the recorder and juſtices of the town, who, in former times, had the power of inflicting capital puniſhments, but all criminals liable to death are now removed to the county gaol at Shrewſbury. There is a court of record every week, in which the recorder and bailiffs ſit as judges. This place ſends two members to parliament, who are choſen by the common burgeſſes, amounting to about 500 in number.

Several of the public buildings of Ludlow are remarkably neat ſtructures. The church, ſituated in the higheſt portion of the town, is a very ſpacious and elegant edifice, in the form of a croſs, and ſeems to have been built in the reigns of Henry VII. and VIII. In the centre riſes a lofty ſquare tower, embattled at the top, and very handſomely embelliſhed. This tower adds in no ſmall degree to the beauty of many of the views from the neighbouring country. The principal entrance to the church is under a large hexagonal porch. The nave is divided from its aiſles by ſix lofty pointed arches on each ſide. The choir is of large dimenſions, and lighted by five lofty pointed windows on each ſide, and one at the eaſt end, which occupies the whole breadth, and nearly the whole height of the choir. This great window is entirely filled with painted glaſs, repreſenting chiefly the legend of St. Lawrence, the patron ſaint of the church. On each ſide of the choir ſtands a chantry chapel. That on the north exhibits ſome very ſplendid remnants of painted glaſs, pourtraying the ſtory of the ring preſented by ſome pilgrims to

Edward the confeſſor; which pilgrims the legend recites were *men* of Ludlow. The whole of this noble church is ceiled with fine oak, and embelliſhed with carving. It is 228 feet in length, and 73 in breadth. In the chancel are many fine monuments of the lords preſidents of the council of Wales, who reſided in the neighbouring caſtle. A variety of tombs likewiſe appear in the church-yard, adjoining to which ſtands an alms-houſe, founded in 1486, by Mr. John Hoſier, merchant, for aged widows and widowers, and rebuilt by the corporation in 1758. Another alms-houſe, ſituated at the bottom of Corve ſtreet, was founded in the year 1590. The grammar-ſchool, erected by Edward IV. in Mill-ſtreet, is a very excellent inſtitution, where both the ancient and modern languages are taught. Nearly in the centre of the town, at the top of Broad ſtreet, ſtands the croſs, a handſome ſtone building, with rooms over it uſed as a public ſchool. The market-houſe, in Caſtle-ſtreet, is a large building; beneath which is an area, ſerving as a corn-market, and the upper rooms, which are very extenſive, are uſed for corporation meetings, balls, aſſemblies, &c. The guild-hall, where the quarter ſeſſions, &c. are held, is a neat, commodious, modern ſtructure, and to the weſt of the church ſtands a range of buildings, called the College. There is likewiſe a priſon, named Goalford's tower.

But the object of greateſt intereſt in Ludlow, and that to which it owes its celebrity and importance, is its caſtle, which ſtands on a bold wooded rock at the north-weſt angle of the town. It was founded, according to the generally received opinion, by Roger de Montgomery, about the year 1130, though ſome writers maintain it to be of earlier origin. Much, however, was added by others at different periods, particularly by ſir Henry Sidney. Robert de Beleſme, grandſon of the founder, having engaged in rebellion againſt Henry I. it was ſeized by that monarch. The caſtle, now made a princely reſidence, was greatly augmented in the ſtrength of its fortifications, and ſupplied with a numerous garriſon. In the reign of king Stephen it was beſieged in conſequence of the governor, Gervas Paganel, having been induced to eſpouſe the cauſe of the empreſs Matilda. With reſpect to the event of the ſiege, different accounts are handed down to us by hiſtorians, ſome aſſerting that the king ſucceeded in reducing it, and others, that finding it impregnable, he was compelled to abandon the attempt. Speed ſays, that the governor, repenting of his conduct in withdrawing from his allegiance, propoſed a capitulation highly advantageous to the garriſon, which was joyfully accepted. During this ſiege, Stephen gave a ſignal proof of his perſonal bravery, in reſcuing prince Henry of Scotland, who had advanced too near the walls, and had been caught from his horſe by a grappling iron, faſtened to the end of a rope. In the troubleſome reign of Henry III. the ambitious Simon Montfort, earl of Leiceſter, ſeized upon this caſtle, in conjunction with Llewellin. From this period nothing remarkable happened till the time of Henry VI. when it was held by Richard duke of York, who laid claim to the crown. Having aſſembled an army of ten thouſand men in the Marches, he drew up a declaration of allegiance to the king, pretending that this large army was only raiſed for the ſecurity of the public peace. Time, however, diſcloſed the perfidy of his views; for no ſooner was he informed of the defeat of lord Audley at Bloreheath, but he threw off the maſk, avowed his pretenſions to the throne, and appointed the caſtle of Ludlow as a place of rendezvous for his adherents. Upon this, the king's forces advanced to Ludford, a vill at a little diſtance from hence. The king's troops preparing for the attack, the duke's forces began to diſband. Sir Andrew Trollop likewiſe went over to the royal ſtandard with a large body, whereupon the duke and his two ſons, with the earl of Warwick and other chiefs, fled with precipitation. Edward, his eldeſt ſon, obtained poſſeſſion of Ludlow in the courſe of the war, and upon his acceſſion to the throne repaired it, and made it the court of his ſon the prince of Wales. Here the latter, after his father's death, was proclaimed king before he removed to London, at the inſtigation of his uncle, Glouceſter, whoſe barbarous uſurpation is not paralleled in the annals of England. Arthur, ſon to Henry VII. fixed his reſidence at this caſtle, and held a court here with vaſt ſplendour and magnificence after his marriage with Catharine of Arragon, afterwards the wife of Henry VIII. At this time the court of the Marches for the principality of Wales was eſtabliſhed here, and continued for many years with much grandeur and ſolemnity. The power of this court was very extenſive, and conſiſted of a lord-preſident, as many counſellors as the prince pleaſed, a ſecretary, an attorney, a ſolicitor, and four juſtices for the counties of Wales. King Charles I., when prince of Wales, viſited this caſtle. It was next diſtinguiſhed by the repreſentation of the celebrated Maſque of Comus in 1634, during the preſidency of John earl of Bridgewater. This exquiſite effuſion of Milton's genius was founded on a real incident. The two ſons of the earl, and his daughter lady Alice, being on their way from a houſe belonging to their family in Herefordſhire to Ludlow,

> "To attend their father's ſtate
> And new intruſted ſceptre,"

were benighted in Haywood foreſt, where the lady was loſt for a ſhort time. The adventure being related to the earl on their arrival at the caſtle, Milton, at the requeſt of his friend Mr. Henry Lawes, who taught muſic in the family, wrote the Maſque. Lawes ſet it to muſic, and performed the character of the attendant ſpirit; the lady herſelf playing the part which ſhe had already acted in real life. The patronage afforded to the muſe of Milton, at this period, by the earl of Bridgewater, does great honour to that nobleman.

During the civil wars in the reign of Charles I. this caſtle was for ſome time kept as a garriſon for the king. In 1645, a ſmall part of the royal army was defeated in this neighbourhood, and on the 9th of June, in the following year, the fortreſs was ſurrendered to parliament. After the reſtoration, the celebrated Samuel Butler, ſecretary to the earl of Carbery, then appointed lord preſident, wrote here a great part of his incomparable poem of Hudibras. From this period nothing remarkable happened till the reign of William and Mary, when the court of the Marches was diſſolved by act of parliament, being, as therein recited, "a great grievance to the ſubject." After this event the caſtle gradually fell into decay, and was deſpoiled of its curious and valuable ornaments. In the days of its proſperity it ſeems to have been one of the moſt extenſive and ſuperb baronial fortreſſes in Europe. It commands grand and extenſive proſpects, and is ſtrongly environed by embattled walls of great height and thickneſs, with towers placed at convenient diſtances. That portion of it which lies neareſt the town, was likewiſe defended by a deep ditch. The whole was divided into two diſtinct parts or courts, one of which contained the palace and lodgings, and the other the court of judicature and records, ſtables, garden, and other offices. The former conſtituted what was properly denominated the Caſtle, and the latter was called the Green or Barbican.

bican. This noble fabric now preſents a maſs of magnificent ruins, retaining, however, ample aſſurances of its former glory. Of the chapel, a circular building, in the inner court, is all that remains. Over ſeveral of the ſtable doors the arms of Elizabeth and the earl of Pembroke are ſtill viſible, and over the inner gate of the caſtle are the arms of the Sidney family, with an inſcription beneath. Along the ſides of the eminence on which theſe ſplendid ruins are ſeated are ſome public walks, which were laid out in 1772, at the inſtigation of the counteſs of Powis. Part of Ludlow caſtle has been recently occupied by Lucien Buonaparte, his family, and ſuite, who are priſoners of war in this country.

The neighbourhood of Ludlow abounds with gentlemen's ſeats and agreeable villages. In the village of Bromefield are the remains of a cell of Benedictine monks, formerly belonging to the abbey of St. Peter, Gloceſter. Theſe ruins ſtand on a delightful ſituation within the grounds of Oakley park, the reſidence of the dowager lady Clive. Richard's caſtle lies about three miles from Ludlow. The town contiguous was originally called Gayton or Boytane, but the luſtre of the caſtle afterwards eclipſed that name, and it is now called by the ſame appellation as the caſtle. This was once a place of conſiderable importance, as is evident from ſeveral old records prior to the time of Henry II. when it began to decay, in ſpite of the exertions of the noble family of Mortimer to ſupport its declining ſtate. Some part of the keep and walls of the caſtle are ſtill remaining. About four miles N.W. of the town is Dowton caſtle, the ſeat of —— Knight, eſq., brother to R. P. Knight, author of a poem called "The Landſcape," and of ſeveral other literary productions. This gentleman built an irregular and ſingular manſion here, and called it a caſtle. He alſo laid out the grounds, immediately adjoining the houſe, in a ſtyle correſponding to his theoretical principles of the pictureſque. On this ſubject both Mr. Knight and his friend Mr. Price have publiſhed ſome eſſays. The grounds and woods of this demeſne are particularly bold, grand, and diverſified. See the Ludlow Guide by J. Price, 18mo. 1797. Alſo an Hiſtorical Account of Ludlow Caſtle, &c. by W. Hodges, 1794.

LUDLOW, a townſhip of America, in Hampſhire county, Maſſachuſetts, 90 miles W. of Boſton; incorporated in 1784, and containing 650 inhabitants.—Alſo, a townſhip on Black river, Windſor county, Vermont, containing 410 inhabitants, 10 or 12 miles W. of Weathersfield, on Connecticut river.

LUDOLF, JOB, in *Biography*, a learned orientaliſt, born in 1624 at Erfurt, in Thuringia, was educated in the univerſity of his native place, paying particular attention to the ſtudy of juriſprudence and of the learned languages, eſpecially thoſe of the Eaſt. With the view of farther improvement he travelled into foreign parts, and was from home during ſix years, when he returned to Erfurt, where he exerciſed the functions of a counſellor for nearly twenty years of his life. He frequently aſſiſted at the diets held upon the ſubject of the conteſts between the dukes of Saxony and the archbiſhops of Mentz. At length, weary of public buſineſs, he obtained leave to retire, and choſe for the place of his retreat the city of Frankfort on the Mayne: but ſcarcely had he ſettled his family, when the elector palatine placed him at the head of his finances. In his ſervice he made two journies to France, where he conſulted the libraries of Paris, in order that he might make ſome advances in his favourite ſtudies. At length he returned to Frankfort, and employed himſelf in finiſhing and reviſing the different works which he had compoſed. He died in 1704, univerſally eſteemed; he has been characterized as equally fitted for the diſpatch of public buſineſs, and the retired purſuits of the cloſet. He was author of a great number of works, of which the principal are, "Hiſtoria Æthiopica," folio; "A Commentary on the ſame;" and an "Appendix." In theſe works the hiſtory, religion, and manners of the Ethiopians are detailed at length. He alſo publiſhed an "Abyſſinian Grammar and Dictionary," folio; "Diſſertatio de Locuſtis," folio; "Faſti Eccleſiæ Alexandrinæ;" "De Bello Turcico feliciter Conficiendo." Moreri.

LUDOLF, HENRY WILLIAM, nephew of the preceding, was born at Erfurt in the year 1655. He was well educated, and was particularly inſtructed in the Oriental languages. He was a man well calculated for public buſineſs as well as deeply learned: he obtained the poſt of ſecretary to the envoy from Chriſtian V. king of Denmark to the court of Great Britain, who recommended him to prince George of Denmark, by whom he was appointed ſecretary in 1680. This ſituation he held ſome years, till a very violent fever rendered him incapable of diſcharging its duties, when he retired wit a handſome penſion. As ſoon as his health would permit he ſet out on his travels to foreign countries. He firſt went to Ruſſia, and having ſoon acquired its language, he met with a polite reception from the natives, and being a good performer in muſic, he had the honour of diſplaying his accompliſhments in this art before the czar of Moſcow, to the ſurprize and delight of that prince. The various knowledge which he diſcovered in his converſations with the Ruſſian clergy led them to conſider him as a prodigy of learning. He arrived in London in 1694, when he underwent an operation of cutting for the ſtone. Having recovered, he applied himſelf to the compoſition of "A Ruſſian Grammar;" intended for the uſe not only of traders and travellers, but of the natives themſelves, by exhibiting the principles of their language in a more regular form than had been laid down before. This work was printed at Oxford in 1696. Ludolf's curioſity led him next into the Eaſt, that he might obtain information concerning the ſtate of the Chriſtian church in the Levant. He arrived at Smyrna in November 1698, whence he went to Jaffa, from Jaffa to Jeruſalem, and from thence to Cairo. As ſoon as Ludolf had returned to England, his reflections on the deplorable ſtate of Chriſtianity among thoſe who profeſſed that religion under the Turkiſh government, induced him to undertake an impreſſion of the New Teſtament in the vulgar Greek, and to preſent it to the members of the Greek church. He was very deſirous that the Proteſtant powers of Europe ſhould eſtabliſh a kind of college at Jeruſalem, and that the perſons ſelected for ſuch an inſtitution ſhould not be devoted to the propagation of the peculiarities of any particular ſyſtems concerning which Proteſtants differ among themſelves, but united by an agreement in the fundamental principles of the goſpel, and by univerſal love and charity. In the year 1709, Ludolf was appointed by queen Anne one of the commiſſioners for managing the money collected for the relief of the Palatines, who had been driven from their native country. He died in 1710. He was author of ſeveral works beſides his "Ruſſian Grammar," which were collected and publiſhed in the year 1712. Gen. Biog.

LUDOLFIA, in *Botany*, a genus of Adanſon's, (Familles des Plantes, v. 2. 244.) named by him after Michael Matthias Ludolff, author of a catalogue of the plants of the garden at Berlin, where he was profeſſor of Botany and Materia Medica, and where his book was printed in 1746. He publiſhed alſo a German Pharmacopeia in 1734; and wrote on the ſubject of botanical claſſification, in the Mem. de l'Acad. de Berlin for 1745, where, according to Haller, he rejects the ſtamens as well as the cotyledons for the purpoſes of arrangement. We have not ſeen this treatiſe. What he offers relative to this matter and others, at the end of his work firſt mentioned, gives no exalted idea of his judgment. The above name has never been eſtabliſhed, the plant of Adanſon being eſteemed a *Tetragonia*. It is curious that Boehmer, in his diſſertation upon plants named after botaniſts, ſuppoſes the *Ludolfia* to have been called after Job Ludolf, author of the *Hiſtoria Æthiopica*, being ignorant, as it ſeems, of the exiſtence of the Berlin profeſſor; but we can have no doubt that Adanſon meant to commemorate the latter.

LUDSCHEN, in *Geography*, a town of Pruſſia, in Oberland; 7 miles E.S.E. of Marianwerder.

LUDSWIGSBURG, a town of Wurtemberg, containing two chapels, one for Roman Catholics and another for Lutherans, and a fine picture gallery, a pleaſant garden, and an old caſtle. The manufactures of this place are cloth, damaſk-linen, and marble paper; 16 miles S. of Heilbron. N. lat. 48° 54′. E. long. 9° 18′.

Though Stuttgard was in 1772 the nominal capital of the duchy of Würtemberg, it had not, for the preceding ten years, been the reſidence of its ſovereign. And though the operas and muſical eſtabliſhments of this prince uſed to be the moſt ſplendid in Europe, during the ſeven years' direction of Jomelli, they were, at the time juſt mentioned, but the ſhadow of what they *had* been. In Burney's German Tour, there is a liſt of his ſerene highneſs's muſical eſtabliſhments, at their moſt flouriſhing time, as well as at that of their declenſion.

In 1771 he had two new ſerious operas, the one compoſed by Jomelli, and the other by Sacchini, entirely at his own expence. The theatre is immenſe, and is open at the back of the ſtage, where there is an amphitheatre in the open air, which is ſometimes filled with people to produce effects in perſpective. It is built, like all other German theatres, on the Italian model.

The prince who reigned in 1772 was himſelf a good harpſichord player; Emanuel Bach dedicated to his highneſs the beſt book of ſix ſonatas which he ever compoſed, printed at Nuremburg. At one time this duke had in his ſervice three of the greateſt performers on the violin in Europe; Ferari, Nardini, and Lolli: on the hautbois, the two Plas, and Schwartz, a famous baſſoon, with Walther on the French horn, and Jomelli to compoſe, for the beſt ſerious and comic ſingers of Italy. At Solitude, a favourite country palace, a conſervatorio was eſtabliſhed for the education of two hundred poor and deſerted male children of promiſing talents; of theſe a great number were taught muſic, and from theſe his highneſs had already drawn ſeveral excellent vocal and inſtrumental performers for his theatre; ſome were taught the learned languagues and cultivated poetry; others were initiated into the practice of the ſtage, as actors and dancers. At Ludſwigſburg there was a conſervatorio for a hundred girls, who were educated in the ſame manner, and for the ſame purpoſes. The building conſtructed at Solitude for the reception of the boys, has a front of ſix or ſeven hundred feet. It uſed to be the favourite amuſement of the duke to viſit the ſchool, to ſee the children dine and take their leſſons.

LUDUS HELMONTII, ſo called from Van Helmont, who extolled its medicinal virtues, in *Natural Hiſtory*, an opaque foſſil of an irregular ſhape, but of a very regular and ſingular internal ſtructure. It is of an earthy hue, and always divided into ſeparate maſſes, by a number of veins of a different colour, and purer matter than the reſt. Theſe maſſes, into which it is divided, are ſometimes ſmall and pretty regularly figured; in which caſe, they are called *tali* or *ludi*, *dice*; but they are more frequently of no regular ſhape at all. There are others of them cruſtated, or compoſed of many coats, diſpoſed one over another about a central nucleus. In theſe the *ſepta*, or dividing veins, are very thin and fine, in the others thicker.

Theſe ſepta were uſed in medicine, being given in nephritic complaints, as it has been ſaid, with ſucceſs: the doſe from a ſcruple to a drachm.

LUDWIG, CHRISTIAN THEOPHILUS, in *Biography*, was born in Sileſia in 1709, and educated for the medical profeſſion. Having a ſtrong bias towards natural hiſtory, he was appointed to accompany Hebenſtreit in his expedition to the north of Africa. (See HEBENSTREIT.) Soon after his return in 1733, he became Profeſſor of Medicine at Leipſic. The firſt theſis defended there under his preſidency, in 1736, related to the manner in which marine plants are nouriſhed. Theſe he ſhewed to differ eſſentially from the generality of the vegetable kingdom, as not deriving their nouriſhment by the root. In 1737 he publiſhed a *Programma* in ſupport of the doctrine of the ſexes of plants, from his own obſervations upon the date palm. Two years afterwards he, nevertheleſs, advanced ſome objections to the Linnæan ſyſtem of arrangement by the organs of impregnation, under the title of *Obſervationes in Methodum Plantarum Sexualem Cel. Linnæi.* This work begins with much juſt commendation of Linnæus, and even with great admiration of his ſyſtem; accompanied however by an attempt at depriving him of the merit of originality, by inſinuating that this ſyſtem had been "indicated by others;" without ſaying by whom. Theſe words are underlined by Linnæus in his own copy of the diſſertation. They are as little to the purpoſe as the ſimilar charge of plagiariſm brought againſt the immortal Harvey. He proceeds to detail various difficulties and miſtakes, which occurred to him in his ſcrutiny of this ſyſtem, ſome of which relate to matters of opinion, others to anomalies or variations in Nature herſelf. His remarks however are free from aſperity or illiberality. He chiefly fails, in point of judgment, when he blames Linnæus for making any particular character important in one genus or family, and not in all; not perceiving that the very eſſence of ſkill, in technical diſcrimination and arrangement of natural productions, conſiſts in diſcovering, in each particular caſe, what is the moſt eſſential for the purpoſe in view. We do not ſee why his diſſertations, "*de minuendis plantarum generibus*," publiſhed in 1737, and "*de minuendis plantarum ſpeciebus*," in 1740, ſhould be deemed inimical to Linnæus, to whom he gives full credit for having eſtabliſhed the ſureſt principles for the advancement of botany, though he criticiſes him here and there in the detail of their application. He alſo wiſhes to indicate ſome ſources of diſcrimination, which Linnæus has leſs regarded, for the accompliſhment of the ſame objects; particularly mentioning the anatomy of plants. He points out the colours of flowers as ſometimes affording permanent ſpecific diſtinctions, though Linnæus has in general diſcarded them from his characters. It muſt be allowed that Ludwig, in this and other inſtances, ſeems prompted by a deſire to differ and to find fault; for Linnæus himſelf founds his primary diviſions of ſpecies in *Meſembryanthemum* and *Gnaphalium*, no matter whether judiciouſly or not, upon this very circumſtance. Such critics however are uſeful to ſcience, as they promote enquiry and examination. Ludwig juſtly blames Linnæus for confounding the bulbous *Fumariæ* as one ſpecies, and he may alſo be correct in ſome other remarks. The late lord Bute has well obſerved, that Ludwig, like Haller, was only a Linnæan in diſguiſe, having frequently applied principles in uniſon with his, if not imbibed from him, to build ſyſtems, and to exerciſe criticiſm, againſt him. Ludwig, in 1756, 1758, and 1759, publiſhed three diſſertations on the colours of flowers, tending to ſhew their variableneſs! If he has in one inſtance ſuggeſted an example to the contrary, he is in that ſurely moſt unfortunate. Haller ſays he points out the *Fraxinella* (*Dictamnus albus* of Linnæus) as a caſe in which colour makes a ſpecific difference. As this plant is frequently raiſed from ſeed, and the progeny differs, under every body's eyes, in having ſome white-flowered plants, perhaps in every crop, we preſume the queſtion may be readily decided; whether the leſſer White Fraxinella, figured in Rivinus, Fl. Pentap. Irr. t. 135, be a diſtinct ſpecies, of which we ſee little probability, or a variety in ſize as well as colour. Rivinus himſelf ſays the common one, t. 134, is either red or white.

Ludwig publiſhed in 1737 his *Definitiones Plantarum*, in 8vo. for the uſe of his pupils. In this the genera of plants are arranged in a method ſuppoſed to be natural, founded on the corolla in the firſt place, the ſubordinate characters being taken from the fruit. The generic diſtinctions are derived from the herbage, flower, ſmell, taſte, colour, or any thing that came in the author's way; certainly with no advantage whatever over the laws and practice of Linnæus, but rather evincing, at every ſtep, the ſuperiority of the latter to the vague ſcheme of his opponent. In another little volume of Ludwig, the *Aphoriſmi Botanici*, publiſhed in 1738, the aſſertion of his being "a Linnæan in diſguiſe" is ſtrongly juſtified. In vain does the writer try to forget the *Philoſophia Botanica*, and to ſeek originality, at any rate, by wandering from its light. In vain does he extol the ſyſtem of Rivinus in preference to all others. He is brought back by his own judgment, in ſpite of himſelf, at every ſtep; and as he could never give the leaſt degree of popularity to the ſyſtem he extolled, the ſlighteſt ſtudy of his works will ſhew it to have been a mill-ſtone about his own neck. Boehmer gave a new and improved edition of the *Definitiones Plantarum* in 1760. Whether any uſe is made of this work at preſent, among the various botanical ſchools on the Continent, we have never heard, but we believe it has fallen into oblivion.

In 1742, and again in 1757, our author publiſhed his *Inſtitutiones Hiſtorico-Phyſicæ Regni Vegetabilis*, in 8vo.; ſtill in purſuit of novelty rather than of truth, he rejects the Linnæan diſtinctions between animals and vegetables, founding the characteriſtic mark of the latter on the ſuppoſed propulſion of their fluids through a cellular texture, and not through a vaſcular ſyſtem as in animals. This diſtinction is now known to have no foundation. In this work at length even the diſguiſe of a Linnæan is almoſt laid aſide, a ſyſtem of arrangement being propoſed in which the ſtamens and ſtyles make an eſſential, if not a leading, feature. The favourite old ſyſtem of Rivinus ſtill takes precedence, though it ſerves only as an additional impediment in the way of natural affinities, which defect is in ſome meaſure concealed by the primary characters not being ſtrictly followed. Thus, though *Eryngium* is violently ſeparated by its infloreſcence from its natural allies, *Iberis* is ſilently left amongſt the *Tetrapetali regulares*. The *Umbellati* are kept together by their infloreſcence, in ſpite of the diverſity of their flowers, as to regularity or irregularity; a difficulty which Rivinus had previouſly been obliged to overlook. It is remarkable that our author, in thus profeſſedly adopting the principles of Rivinus and Linnæus combined, and diſclaiming as he does, p. 86, all pretenſions to originality, never mentions thoſe perſons from whom he had long ago aſſerted that Linnæus borrowed his ſyſtem. This volume may therefore be conſidered as a tacit tribute of reſpect to the illuſtrious Swede, ariſing from its author's progreſs in judgment and experience. He had no motive to withhold this tribute, as Linnæus never reſented nor repelled his attacks. The latter ſays in a letter to Haller, "I have read the Characters of Dr. Ludwig entirely through. He has given very great attention to the ſubject; but I wiſh the authors whom he chiefly follows may not have led him aſtray. All that comes from Boerhaave is not oracular. I every day augment or correct my own characters, which are nothing but generic deſcriptions, and therefore differ from thoſe of Ludwig and Tournefort, as a ſpecific name (or definition) differs from the deſcription of a plant. Both are neceſſary in Botany." *Epiſt. ad Hallerum* v. 1. 312. We give this paſſage entire, becauſe Haller in his index ſays Linnæus here "carps at Ludwig," than which ſurely nothing can be more unjuſt.

Our author began, in 1760, to publiſh impreſſions, chiefly of medicinal plants, taken from the dried ſpecimen with printer's ink, or with ſmoked paper, in folio, under the title of *Ectypa Vegetabilium*, which he continued from time to time. Such impreſſions give undoubtedly a correct outline, at leaſt if the plant be fully diſplayed, but the reſt is a maſs of confuſion; eſpecially as the more elevated parts, which ſhould be light, are neceſſarily the darkeſt. He wrote alſo occaſionally on medico-botanical ſubjects, as on the effects of extract of *Stramonium*, and of the *Belladonna*, or Deadly Nightſhade, in the epilepſy. His opinion ſeems not to have been favourable of either.

Ludwig died at Leipſic in 1773, aged 64. He left a ſon named Chriſtian Fredrick, born in 1751, who became Profeſſor of Natural Hiſtory in the ſame univerſity, and is the author of various tracts on Botany, Anatomy, and Phyſiology.—Ludwig's Works. Hall. Bibl. Bot. Dryandr. Bibl. Banks. S.

LUDWIGIA, in *Botany*, named by Linnæus in honour of Chriſtian Theophilus Ludwig, Profeſſor of Medicine in the univerſity of Leipſic. (See the preceding article LUDWIG C. T.) Linn. Gen. 60. Schreb. 83. Willd. Sp. Pl. v. 1. 672. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 265. Juſſ. 319. Lamarck Illuſtr. t. 77. Gærtn. t. 31.—Claſs and order, *Tetrandria Monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Onagræ*, Juſſ.

Gen. Ch. *Cal.* Perianth ſuperior, of one leaf, permanent, cloven into four, lanceolate, widely ſpreading ſegments, equal in length to the corolla. *Cor.* Petals four, inverſely heart-ſhaped, flat, greatly ſpreading, equal. *Stam* Filaments four, awl-ſhaped, erect, ſhort; anthers ſimple, oblong, erect. *Piſt.* Germen inferior, quadrangular, clothed with the baſe of the calyx; ſtyle cylindrical, as long as the ſtamens; ſtigma ſlightly four-ſided, capitate. *Peric.* Capſule of four valves, the partitions oppoſite to the valves. *Seeds* numerous, ſmall. *Recept.* columnar, membranaceous, four-winged; wings at the angles of the partitions, bearing ſeed at each ſide.

Eſſ. Ch. Corolla of four petals. Calyx four-cleft, ſuperior. Capſule ſquare, inferior, of four cells, and many ſeeds.

1. L. *alternifolia*. Linn. Sp. Pl. 173. Trew. Rar. p. 2. t. 2. (Lyſimachia non pappoſa, flore luteo majore; Pluk. Alm. t. 203. f. 2.)—Leaves alternate, lanceolate. Stalks axillary, ſingle-flowered. Stem erect, angular. Calyx-leaves remarkably large.—Native of Virginia, and ſent from thence, to Miller, by Dr. Dale before 1752. It flowers in June and July.—*Root* annual. *Stem* about a foot high, upright, branching. *Flowers* ſolitary, ſmall and yellow, ſituated at the baſe of the leaf-ſtalks.

2. L. *hirſuta*. Willd. n. 2. Lamarck Dict. v. 3. 614.—

Leaves alternate, lanceolate. Flowers axillary, ſolitary, nearly ſeſſile. Stem round, diffuſe.—A native of South Carolina.—Lamarck obſerves that this is very nearly allied to the laſt ſpecies in the form and arrangement of its leaves. The whole plant however is hairy. *Stem* woody, cylindrical, branched. *Leaves* alternate, oblong-lanceolate, entire. *Flowers* ſolitary, axillary, on ſuch ſhort ſtalks as to be nearly ſeſſile, furniſhed at their baſe with two oppoſite, very long bracteas. *Fruit* leſs angulated than in the other ſpecies.

3. L. *juſſiæoides.* Willd. n. 3. Lamarck Dict. v. 3. 614.—Leaves alternate, linear-lanceolate. Flowers axillary, ſolitary. Germen very long.—A native of marſhy ground in the Iſle of France.—This is ſaid particularly to reſemble *Juſſiæa* in its habit, whence the ſpecific name.—*Stem* about a foot and half high, ſhrubby, branched. *Leaves* alternate, ſcattered, pointed, entire. *Flowers* ſolitary. *Petals* yellow, the length of the calyx.

4. L. *oppoſitifolia.* Linn. Syſt. Veg. ed. 14. 161. Willd. n. 4. (L. perennis; Linn. Sp. Pl. 173.)—Lower leaves oppoſite, lanceolate. Stem diffuſe.—A native of the Eaſt Indies.—*Stems* procumbent, ſix or eight inches long. *Branches* nearly all radical. *Leaves* ſmooth, entire, ſtriated, three or four pair of the lower ones only oppoſite, the reſt alternate. *Flowers* yellow. *Petals* ſhorter than the calyx.

5. L. *erigata.* Linn. Syſt. Veg. ed. 14. 161. Mant. 40. Willd. n. 5. (L. triflora; Lamarck Dict. v. 3. 615.)—Leaves oppoſite, lanceolate. Stem erect.—A native of the Eaſt Indies.—*Root* annual. *Stem* a foot high, herbaceous. *Leaves* on footſtalks, quite entire, ſmooth. *Flowers* ſo ſmall as to be ſcarcely viſible.

L. *repens,* Swartz. Ind. Occ. v. 1. 273, proves, by a ſpecimen from himſelf, to be *Iſnardia paluſtris* of Linnæus, as Willdenow mentions.

Michaux, in his Fl. Boreal-Amer. v. 1. 87, defines nine ſpecies as natives of North America, chiefly Carolina, of none of which we have any preciſe information. They are called *nitida, pedunculoſa, microcarpa, anguſtifolia,* (which he ſuppoſes to be *ramoſiſſima* of Walter,) *juſſiæoides,* (taken for *decurrens* of Walter,) *macrocarpa,* (which is the *alternifolia* of Linnæus,) *virgata, mollis,* and *capitata.* The laſt is ſaid to be *ſuffriticoſa* of Walter.

LUDWIGSBURG, in *Geography,* a town of Anterior Pomerania, on the coaſt of the Baltic; five miles E.N.E. of Griefswalde.

LUDWIGSTAT, a town of the principality of Culmbach; 13 miles S. of Saalfeld.

LUDWIGSTEIN, a town of the principality of Heſſe Rhinfels; 14 miles E. of Caſſel.

LUDWIGSTHAL, a town of Wurtemberg, famous for its iron forges; about one mile from Duttlingen.

LUDWIGWALL, a town of Pruſſia, in Natangen; four miles S. of Königſberg.

LUC, St., the chief town of the captainſhip of Petagues, in the north diviſion of Braſil.

LUES, in a general ſenſe, is uſed for a diſeaſe of any kind.

LUES, in a more particular ſenſe, is reſtrained to contagious and peſtilential diſeaſes.

LUES *Venerea,* the venereal diſeaſe; called alſo *morbus gallicus, ſyphilis, morbus neapolitanus, morbus aphrodiſius,* &c. In French, *la maladie vénérienne,* or *la verole,* or *grande verole;* in German, *luſtſ-euche franzoſen.*

The venereal diſtemper ariſes from a peculiar and ſpecific morbid animal poiſon, which, when applied to the human body, is capable of producing both local and conſtitutional effects, ſuch as primary ſores or chancres, buboes, ſpots on the ſurface of the body, nodes, ulcerations of the throat, pains in the bones, ſecondary ulcers, &c. Excepting chancres, none of theſe complaints can occur, unleſs ſome of the ſyphilitic virus has been taken up, and conveyed into the conſtitution by the abſorbents proceeding from the primary ſore, or ſurface originally infected. The venereal poiſon affects the human ſpecies alone, and has not the property of imparting the diſeaſe to any other animals. When applied to the human body, "it has the power of propagating or multiplying itſelf;" that is to ſay, it gives riſe to a ſore, from which is ſecreted matter containing a virus of the ſame ſpecific nature. Of its appearance in an unmixed ſtate we really know nothing; for we never ſee the poiſon in any other form than that in which it is blended with fluid matter. Its general properties are equally unknown; ſo that, if we put out of conſideration its peculiar and remarkable effects on the human body, our ignorance of its nature is complete. It is not contagious through the medium of effluvia, or any volatile inviſible matter in the air, the infection never being communicated, except by actual contact. The virus muſt be applied to a part of the body; the uſual local effect is a particular ſore, called a chancre; and ſome of the poiſonous matter at length being imbibed by the abſorbents, buboes, eruptions, &c. follow. Many caſes ſeem even to prove that the poiſon may be abſorbed from the ſkin, and buboes and conſtitutional ſymptoms take place, without the occurrence of any primary ſore at all in the part to which the infectious matter was firſt applied.

Before entering into a more detailed account of a diſtemper which, as being a kind of ſcourge to illicit pleaſure, and a curb to the moſt impetuous of paſſions, has made the generality of mankind very feelingly intereſted in the ſubject, we ſhall ſolicit the reader's attention to a point that is in the higheſt degree curious, and has afforded matter for numerous diſputations.

Of the firſt Origin of the Venereal Diſeaſe.—Several writers have endeavoured to prove the great antiquity of this diſtemper. The principal of theſe are, Mr. William Becket, whoſe papers are contained in the 30th and 31ſt vols. of the Philoſophical Tranſactions; Dr. Charles Patin, and Dr. Sanchez, authors of diſſertations on the origin of the diſeaſe. The opinion has even been maintained, that the venereal malady has exiſted from time immemorial, and paſſages in ſupport of this ſentiment are referred to in Hippocrates, Galen, Avicenna, Celſus, and likewiſe the holy ſcriptures. "The Lord ſhall ſmite thee in the knees, and in the legs, with a ſore botch, that cannot be healed, from the ſole of thy foot unto the top of thy head." (Deuteronomy, chap. xxviii. ver. 35.) This, and many other ancient quotations, however, cannot be received as proofs, that ſyphilis was the affliction alluded to, becauſe the leproſy, elephantiaſis, and ſeveral other diſeaſes, attended with ulcers, or eruptions, might be ſignified, as far as a judgment can be formed, from the words actually employed. (See Lombard ſur la Mal. Vénérienne, tom. i. p. 39.) That the Greeks and Romans were at all acquainted with the venereal diſeaſe ſeems extremely improbable, and is an aſſertion quite uneſtabliſhed. As Dr. Adams has well obſerved, the ancient phyſicians, being ignorant of the medical powers of mercury, muſt have been infinitely more familiar with every form of the diſeaſe than ourſelves. Yet, till near the cloſe of the 15th century, we have no deſcription of local appearances that can be miſtaken for venereal; and during the following century, the induſtrious Aſtruc enumerates more than one hundred writers on the ſubject. If other proofs are required, let us mark the difference between the licentious poets of former times and our own. Can a reader of common ſenſe ſuppoſe that Horace, Juvenal, Perſius, or Ovid, could have been ſilent on a ſubject ſo perpetually occurring in the ſatirical writings of Pope and Swift? On Morbid Poiſons, p. 88. edit. 2.

But though it muſt be owned that the attempts to trace the exiſtence of the venereal diſeaſe as far back as the times of Moſes, and of the Greeks and Romans, have entirely failed, we muſt not infer that the people of thoſe remote periods were not ſubject to maladies of the generative organs. Celſus has expreſsly treated of ſuch complaints, and they probably afflicted mankind at a much earlier period than the reign of Auguſtus. The ancients were certainly liable to ſores on the genitals; but theſe ulcers, like many which are met with at the preſent day in the ſame ſituation, were not ſyphilitic, notwithſtanding they might ſometimes put on a very bad aſpect.

Giving up the ſuppoſition of lues venerea being of ſuch antiquity, ſtill it is contended that the diſorder prevailed in Europe long before the return of Columbus from his voyage to America, or Charles VIII. beſieged Naples; two events which happened at the cloſe of the 15th century, when it is commonly thought that the diſeaſe firſt began its ravages in Spain and Italy, and thence ſpread to other parts of the old world. We are told that Gulielmus Salicetus, who practiſed at Verona in 1210, was well acquainted with the cauſe and effects of ſyphilis, and, in confirmation of this remark, we are referred to his work on ſurgery, where may be found a chapter, intitled, "De puſtulis albis, et ſciſſuris et corruptionibus quæ fiunt in virga et circa præputium, propter coitum cum meretrice, vel alia cauſa." Gordon, who lectured on phyſic at the univerſity of Montpelier in 1289, mentions, in chap. 5, "De paſſionibus virgæ," the affections originating from connection with women whoſe wombs are foul, virulent, ſanious, infectious, &c.; and he likewiſe ſpecifies a remedy for a chancre proceeding from ſuch a cauſe. See Lombard ſur la Maladie Vén. tom. i. p. 40.

In the 30th and 31ſt vols. of the Philoſophical Tranſactions, Mr. W. Becket publiſhed his papers in ſupport of the antiquity of lues venerea. In his firſt diſſertation, he labours to prove that a venereal gonorrhœa was known in England ſome ages before the year 1494, under the name of *ardor*, *arſura*, *incendium*, *&c.* in Engliſh, *brenning* or *burning*, of which, indeed, there is frequent mention made by Britiſh hiſtorians. In confirmation of this opinion, Mr. Becket produces authorities, of which ſome are earlier, and others later than the year 1494, the period when lues venerea is generally imagined to have firſt ſhewn itſelf in Europe.

The earlieſt of theſe authorities being the moſt material, will alone be noticed by us.

1. The firſt is a manuſcript treatiſe of John Arden, an eminent ſurgeon in England, about the cloſe of the 14th century. In this book mention is made of *burning*, which, according to Becket, is defined "a certain inward heat and excoriation of the urethra."

2. The ſecond authority reſts upon certain phyſical pieces ſuppoſed to have been written about the years 1390 and 1440. Theſe works are ſaid to contain ſome receipts for the cure of this *brenning*, both in men and women.

3. The third and laſt that we ſhall notice is founded upon the manuſcripts, rules, and ordinances of the ſtews, which were by public authority allowed to be kept at London, in the Borough of Southwark, under the controul of the biſhop of Wincheſter. Theſe documents are ſuppoſed to have been drawn up about the year 1430. One of them begins thus: "Of thoſe, who keep women having a wicked infirmity," and further, it is ordered, under a ſevere penalty, that no ſtew-holder keep any woman "wythin his hous that hath any ſyckneſs of brenning."

The celebrated Dr. Aſtruc, on the other hand, has deduced a different inference from theſe productions, without denying that they may be authentic; for he will not admit that this burning was the ſame diſeaſe as a venereal gonorrhœa, or that a venereal gonorrhœa was at any time expreſſed by ſuch a term. His arguments are ſupported by conſiderations of the following kind.

1. The leproſy of the Arabians, which was formerly a common diſeaſe in England, as well as in other parts of Europe, was exceedingly contagious and infectious; and, therefore, lepers were, by ſeveral ſevere edicts, prohibited from having intercourſe with the reſt of mankind.

2. In caſe any perſon had carnal knowledge of a leprous woman, the leproſy was communicated to him by almoſt immediate infection. That the diſeaſe was thus imparted, is proved by Foreſtus, Obſ. Chirurg. lib. iv. Obſ. 8. Palmarius de Elephantiaſi, cap 2. Paræus, Op. lib. xx. cap. 8. Fernelius de Partium Morbis et Symtomatis, lib. vi. cap. 19. Valeſius de Taranta, Philon. 7. cap. 39. Gordon's Lilii Partic. i. cap. 22.

3. When the caſe did not turn out to be leproſy in the worſt form, yet the pudenda were for the moſt part affected with an inflammation, eryſipelas, herpetic or miliary exulcerations, cuticular eruptions, &c.; whence aroſe a dyſuria, called, in old language, *ardor*, *arſura*, *incendium*, *calefactio*, and, in Engliſh, *brenning*.

4. In confirmation of this ſtatement, Aſtruc cites Theodoric's Chirurg. lib. vi. cap. 55; a manuſcript treatiſe on ſurgery, intitled Rogernia; Gilbert's Compend. Medicin.; Glanville's Breviarium Medicinæ, lib. ii. cap. 4; John of Gaddiſden's Roſa Anglica, cap. de infect. ex concubitu cum leproſo vel leproſa; and, laſtly, John Manardus, of Ferrara, in Epiſt. Med. lib. vii.

5. All theſe writers deſcribe the complaints caught by commerce with leprous women, and, on the whole, Aſtruc infers that the *burning*, or *brenning*, referred to by Mr. Becket, was the ſame diſorder as, according to the doctor's authorities, might ariſe from connection with a leprous woman, or one who had lately cohabited with a leprous man. As for the *nefanda infirmitas*, mentioned in the laws of the ſtews, Dr. Aſtruc conceives it muſt have been the leproſy itſelf. De Morb. Venereis.

We ſhall not follow theſe gentlemen through the whole of their arguments. The moſt important are ſet before the reader, and he muſt judge of them himſelf. That diſcharges from the urethra, attended with heat and pain in making water, muſt have exiſted from time immemorial, we decidedly believe; becauſe experience has well proved that ſuch complaints may often proceed from cauſes which are decidedly not venereal. Nay, it is even a queſtion among modern ſurgeons, whether any claps at all originate from the ſame poiſon as lues venerea. This point, though ſo highly intereſting, is far from being ſettled; and notwithſtanding the ſentiments of Mr. Hunter, we think the arguments and facts at preſent on record are rather more weighty in favour of the doctrine, that a gonorrhœa does not depend upon the ſame virus as ſyphilis. According to Fallopius, what has been called a venereal gonorrhœa did not ſhew itſelf among the ſymptoms of this diſeaſe before the year 1545, or 1546, that is, above fifty years after the period commonly aſſigned for the firſt eruption of ſyphilis. (Tract. de Morb. Gallico, cap. 23.) Suppoſing that a gonorrhœa really depended on the ſame infectious matter, is it credible that the complaint ſhould never occur for half a century, during all which time chancres, and other venereal affections, are known to have prevailed to a very great extent? As we ſhall be obliged to touch upon this ſubject again, and have already mentioned it in the article GONORRHŒA, we ſhall not purſue it at preſent. In our opinion, Becket has fully proved that inflammations, diſcharges, &c. exiſted long before the year 1494; but his evidence fails in eſtabliſhing that they were actually venereal.

Aſtruc himſelf has very ſenſibly remarked, "that the genitals are no leſs ſubject to violent diſeaſes than the other parts of the body, that they are equally expoſed to all the cauſes of indiſpoſition, and that they enjoy no prerogative above the reſt to guard them againſt the attack of diſtempers. From the very infancy of phyſic, and long before the venereal diſeaſe was known, ſeveral writers have treated at large of an abſceſs, ulcer, cancer, and mortification in the genitals." (See Galen, lib. vi. de locis affectis, cap. 6, and Cornelius Celſus, lib. ii. cap. 1. lib. v. cap. 20. and lib. vi. cap. 18.) Aſtruc alſo quotes the hiſtorian Flavius Joſephus, who, in his ſecond book againſt Apion, related, that that vile ſlanderer of the Jews was afflicted with an ulcer in the penis, of which diſeaſe, after ſeveral inciſions to no purpoſe, he died in exquiſite torments, the genital parts being mortified. And again, (Hiſt. Jud. lib. xvii. cap. 8.) he ſays, that Herod, king of the Jews, died conſumptive and convulſed, his private parts being putrefied and eaten up by worms. Aſtruc likewiſe quotes paſſages from Euſebius, Pliny, and other ancient authors, ſhewing, beyond all doubt, that complaints and diſeaſes of the generative organs exiſted and prevailed in the earlieſt times. The phimoſis, paraphimoſis, and hyperſarcoſis, or caruncle of the urethra, among other caſes, were undoubtedly known to the Greek phyſicians; but then, theſe diſorders proceeded from an ordinary cauſe, and not from any venereal contagion, as will be plain to any one who will take the trouble to conſult the old writers.

Diſmiſſing the idea of the venereal diſeaſe being ſo ancient as ſome have ſuppoſed, let us examine what grounds there are for believing that the cloſe of the fifteenth century was the era, when the diſorder firſt commenced its ravages in Europe.

The authorities in ſupport of the opinion, that the venereal diſtemper firſt made its appearance in this quarter of the world towards the latter end of the year 1494, are the united teſtimonies of all the medical writers who at that time flouriſhed in Italy, and who could not confound it with the leproſy, which, being then a common diſeaſe, was well known to them. The practitioners of that period were aſtoniſhed at the novelty of the malady; and finding, from experience, that the medicines, which were uſually given in analogous caſes, proved ineffectual, were at a loſs what method to purſue, and, for a time, gave up the treatment into the hands of quacks.

Joſeph Grunpech, a German phyſician, publiſhed, in the year 1496, "Tractatum de Peſtilentiali Scorræ, ſive Malade Frantzos," in which he affirms, that it was a diſeaſe ſo lately inflicted on mankind, that it ſeemed to be a plague ſent down from heaven; that it was a new kind of diſeaſe, hateful to nature, a moſt horrid and terrible prodigy, and altogether unknown to mortals before that time.

Alexander Benedict of Verona, who was phyſician in the Venetian army, which Charles VIII. of France deſtroyed in the battle of Fornova, in the year 1495, and therefore had the opportunity of obſerving the firſt appearance of this new diſeaſe, aſſerts in his work, "De omnibus Morbis," publiſhed in 1496, that, "by the venereal contact, a new French diſeaſe, or, at leaſt, one that was unknown to former phyſicians, owing to the peſtiferous aſpect of the ſtars, had burſt in upon them from the weſt;" and, in another part of his work, that "the French diſeaſe, a new plague which had ſprung up in the world, contracted by lying together and contact, was reckoned in his time incurable."

Nicolas Leonicenus of Vicenza, profeſſor of phyſic at Ferrara, in a treatiſe, which he wrote in 1496, "De Morbo Gallico," obſerves, that "new diſeaſes had appeared in Italy, which were unknown to former ages, after the manner of the lichenis, which, according to Pliny, Hiſt. Nat. lib. xvi. were never known before the time of Claudius." Then he continues: "Something like this has happened in this age; for now a new diſeaſe, of an unuſual nature, has attacked Italy, and ſeveral other countries: however, this diſeaſe has obtained no proper name hitherto by our preſent phyſicians, but they commonly call it the French diſeaſe; as if the contagion had been imported by the French into Italy, and that this country was infeſted both by the diſeaſe and the arms of France at the ſame time. I, for my part, am forced to believe, (nor, indeed, can I conceive the caſe to be otherwiſe,) that this infectious diſeaſe, which has lately ſprung up, has haraſſed this preſent age as it never did any former one."

Coradinus Gilinus, in his "Opuſculum de Morbo Gallico," begins thus:

"Laſt year (1496) a very violent diſeaſe attacked great numbers of people, both in Italy and on the other ſide of the mountains, which the Italians call the French diſeaſe, affirming that the French introduced it into Italy; which the French call the Italian or Neapolitan diſeaſe, becauſe, they ſay, they were firſt infected in Italy, and eſpecially at Naples, with this cruel plague; or, becauſe the diſeaſe appeared firſt in Italy, at the time of the paſſage of the French over the mountains. And as this diſeaſe is yet unknown to the moderns, and there have been, and ſtill ſubſiſt great debates about it amongſt phyſicians, I have therefore determined to write ſomething upon it."

Dr. Aſtruc further confirms the opinion, that the diſeaſe was regarded quite as a novelty at the cloſe of the fifteenth century, by numerous other citations from the works of the medical writers, who publiſhed within a moderate ſpace after that period: as, for inſtance, Bartholomew Montagnana, Gaſper Torella, Anthony Bonevenius, Wendelinus Hock de Brackenaw, Jacobus Cataneus, Peter Trapolinus, John de Vigo, Peter Maynard of Verona, Ulrich Utten, a German knight, who publiſhed his own cure by guaiacum, James à Bothincourt, Lawrence Phriſius, Peter Andrew Matthiolus, Alphonſus Ferrus, Jerome Fracaſtorius, Anthony Muſa Braſſavolus, Gabriel Fallopius, &c.

Not only is the foregoing ſtatement corroborated by medical writers, it receives additional teſtimonials from ſeveral hiſtorians; particularly Mark Anthony Coccius Sabellicus, in Rhapſod. Hiſt. lib. ix. firſt publiſhed at Venice in 1502; Baptiſt Fulgoſius, in his treatiſe on Memorable Actions, written in 1509; Jean de Bourdigné, in his Hiſtory of the Province of Anjou, publiſhed 1529; Guicciardini, in his Hiſtory of Italy, &c.

That the venereal diſeaſe firſt began to make ravages in Europe, and in particular that it afflicted many ſoldiers of the army of Charles VIII. at the ſiege of Naples, towards the cloſe of the fifteenth century, appears then to be proved beyond diſpute. But ſtill other queſtions remain for determination. Was the venereal infection originally produced in Italy? or, was it conveyed thither from America, which had been diſcovered a little before the breaking out of the diſtemper in Europe?

We learn from hiſtory, that the new world was firſt found out by Chriſtopher Columbus. In Auguſt 1492, he ſet ſail with three ſhips and 120 men, arrived at Hiſpaniola in December of the ſame year, and returned to Spain in March 1493. On the 25th of September following, he departed from Cadiz again with 17 ſhips and 1500 men, beſides mariners and workmen; and, in November, he arrived once more at Hiſpaniola. In the following year, 1494, he diſpatched 14 ſhips back to Spain. In April 1494, Barth. Columbus, the brother of Criſtopher, arrived at Hiſpaniola with three ſhips, which returned to Spain, about the concluſion of the ſame year, with Pedro de Margarit, a Catalonian gentleman, and father Bayl, a Benedictine monk: the former was, at that time, ſeverely afflicted with the venereal diſeaſe. In Auguſt 1494, four other ſhips arrived at Hiſpaniola from Spain, under the command of Antonio de Torrez, and returned at the ſame time as thoſe laſt ſpecified. Laſtly, in October 1495, John Aguado, the envoy of their Catholic majeſties, came to Hiſpaniola with four ſhips, to inquire into the crimes of which Chriſtopher Columbus ſtood accuſed; and, the year following, departed for Cadiz, where he arrived with Chriſtopher on the 11th of June 1496, and with 200 ſoldiers, who were infected with the venereal diſeaſe.

The firſt conveyance of this diſtemper from the Weſt Indies to Europe, by the followers of Columbus, is ſupported by numerous teſtimonies; among which are thoſe of Anthony Muſa Braſſavolus, John Baptiſta Montanus, Gabriel Fallopius, and Roderic Diaz. Theſe confirm the diſeaſe to have originated in the Weſt Indies, and to have been brought over by Columbus's men; that it appeared in Spain firſt in 1493, at Barcelona, and there ſpread immediately through the whole city; that, in Hiſpaniola and the adjacent Weſt India iſlands, the diſeaſe was very frequent and familiar to the natives, who had found out an antidote, called guaiacum wood; and, laſtly, that the diſtemper in America was milder than in Europe, where, on its firſt breaking out, it was undoubtedly more ſevere than at ſubſequent periods.

This laſt circumſtance is referred by ſome authors to the treatment being now better underſtood, and, in particular, to the efficacy of mercury, with which practitioners were formerly unacquainted. Others appear to think the diſtemper actually milder in its nature. Mr. Foot entertains the firſt of theſe opinions; while Aſtruc and Sydenham profeſs the latter. Our own obſervations have induced us to believe, that the diſeaſe has actually become ſomewhat milder within the laſt fifteen years: for, we are ſure, not half ſo many bad and fatal caſes are now met with in the London hoſpitals, as were ſeen about the cloſe of the preceding century. If this be a fact, it cannot be aſcribed to our more familiar acquaintance with mercury, though it may perhaps be imputed to better treatment; for there can be no doubt that many caſes have been exaſperated by the long, unremitting, and violent ſalivations, which the old ſurgeons, who were blinded by falſe fears and prejudices, deemed ſo eſſential to the radical cure of the diſtemper.

There is only one other ſentiment, which we have to notice, reſpecting the firſt origin of ſyphilis, namely, that it was not brought from the Weſt Indies, but began in Europe, as an epidemical affection. Mr. Hunter ſeems inclined to think, that the diſtemper did not originally come from the Weſt Indies; and he was led into this perſuaſion by reading a ſhort treatiſe, entitled, "A Diſſertation on the Origin of the Venereal Diſeaſe; proving, that it was not brought from America, but began in Europe from an epidemical Diſtemper. Tranſlated from the original Manuſcript of an eminent Phyſician. London, printed for Robert Griffiths, 1751."

In our opinion, however, Aſtruc has adduced abundant proofs of the diſtemper having exiſted in Hiſpaniola, before it was at all known in Europe; and he has explained, as ſatisfactorily as can reaſonably be expected, how the diſeaſe was conveyed from the Weſt Indies to Barcelona in 1493, and to Italy ſhortly afterwards.

The ſubject, which we are about to quit, is highly intereſting; though the time that has now elapſed, ſince the commencement of lues venerea in Europe, forbids any advantageous inveſtigations of the controverted points. That the ancient leproſy could not be ſyphilis, Dr. Aſtruc has entirely ſatisfied us; and we join him in the belief that the latter diſeaſe was originally imported into Europe from the Weſt Indies. It is unqueſtionably a matter of infinite curioſity, that the leproſy, common as it was in former times, ſhould ſcarcely ever have made its appearance after the venereal diſeaſe ſpread over Europe; but this may not be more curious and unaccountable than the departure of the plague, and the acceſs of the ſmall-pox. See Aſtruc De Morbis Venereis, and Foot on Lues Venerea.

General Obſervations.—As Mr. Hunter has remarked, in whatever manner the diſeaſe aroſe, it certainly began in the human race; for we know of no other animal that is capable of being infected with this poiſon. It is probable, too, that the parts of generation were the firſt affected; for if the diſorder had occurred in any other part of the body, it might probably never have gone further than the perſon in whom it firſt aroſe, and, therefore, never have excited public attention; but as it was ſeated in the parts of generation, where the only natural connection takes place between one human being and another, except that between the mother and child, it was in the moſt favourable ſituation for being propagated. Beſides, as no conſtitutional effect of the poiſon can impart the diſeaſe to others, we are obliged to conclude that the firſt effects were local.

We know little about the ſyphilitic poiſon, if we exclude from conſideration its effects upon the human body. It is commonly in the form of pus, or united with pus, or ſome ſuch ſecretion, and, when applied to parts, it has the peculiarity of giving riſe to a proceſs, in which is produced matter of ſimilar qualities to its own. In moſt caſes, it excites an inflammation in the parts contaminated: but there is not ſimply inflammation; a peculiar mode of action is ſuperadded, different from all other actions attending inflammation; and, according to Mr. Hunter, it is this ſpecific mode of action that produces the ſpecific quality in the matter. The peculiar mode of action, however, may exiſt without the preſence of inflammation: at leaſt, this inference is drawn, ſince the poiſon continues to be formed, and a healing chancre will communicate the diſeaſe to another perſon.

The formation of matter, alſo, though a very general, is not a conſtant attendant on this diſeaſe; for ſometimes the ſyphilitic poiſon produces a kind of inflammation, which does not terminate in ſuppuration. But, according to Mr. Hunter, no venereal poiſon can exiſt, unleſs matter is formed. A perſon, therefore, having the venereal irritation in any form, not attended with a diſcharge, cannot communicate the diſeaſe to another. To impart the diſorder, the venereal action muſt firſt have taken place; matter muſt have been formed in conſequence of that action; and ſuch matter muſt be applied to the perſon who is to be infected. We have no examples of this diſtemper being communicated by vapour, or effluvia, like many other diſeaſes.

Mr. Hunter believed, that the circumſtance of the virus being more or leſs diluted, in different caſes, is not the cauſe of any variety in the effects produced, provided the dilution is not ſo conſiderable as to prevent the poiſon from having any action at all. The ſame matter appears to affect very differently different people; and the diverſity of the ſymptoms is, therefore, attributed to cauſes exiſting in the conſtitution and habit.

In treating of GONORRHŒA, we have adverted to the long diſputed queſtion, whether the virus of that diſeaſe is of the ſame nature as that which gives riſe to lues venerea? We have there explained Mr. Hunter's reaſons for believing in the identity of the two poiſons, and mentioned the motives which have hitherto kept us from giving credit to the doctrine. Mr. Hunter declares that he has ſeen all the ſymptoms of lues venerea originate from gonorrhœa only; that he had even produced venereal chancres by inoculating with the matter of gonorrhœa; and that he had repeated theſe experiments in a manner in which he could not be deceived. (On the Ven. Diſeaſe, p. 293, &c.) He has referred the different effects of the virus, in theſe caſes, to the difference in the nature of the parts affected. He maintains that the matter of a chancre will produce either a gonorrhœa, a chancre, or the lues venerea. Suppoſing the poiſon to be the ſame both in the chancre and gonorrhœa, why do not theſe complaints always happen together in the ſame perſon? For one would naturally think that the gonorrhœa, when it has appeared, could not fail to become the cauſe of a chancre; and that ſuch ſore, when it happens firſt, muſt produce a gonorrhœa. Mr. Hunter believes that this ſometimes really occurs, although he confeſſes it is only ſeldom; and he ſuſpects that the preſence of one irritation in general becomes a preventive of the other.

The experiments made by Mr. Hunter with the matter of gonorrhœa and chancre, have been repeated with a different reſult. (See B. Bell on Lues Venerea, chap. 1.) On the other hand, the defenders of Mr. Hunter's opinion contend, that we cannot wonder at this contrariety, when we conſider from how many cauſes gonorrhœa may ariſe, and how impoſſible it is to diſtinguiſh the venereal from any other. See Adams on Morbid Poiſons, p. 91, edit. 2.

Having already touched upon this controverted ſubject, in ſpeaking of *Gonorrhœa*, we ſhall here refrain from commenting on the arguments adduced againſt the identity of the virus, from mercury being requiſite for the cure of chancres, and not neceſſary in the treatment of gonorrhœa. Neither ſhall we expatiate on the aſſerted experiment, that venereal matter, applied to the urethra, will produce a chancre in that canal, and not ſimply a diſcharge. We wiſh, however, in this place, to call the reader's attention again to the circumſtance of gonorrhœa not being deſcribed as a ſymptom of ſyphilis, till nearly half a century after the other ſymptoms of the venereal diſeaſe were known. Fallopius was the firſt who ſet down a clap as an effect of the ſyphilitic virus. The fact of gonorrhœa not having been remarked as a ſymptom of lues venerea till ſo long a time after this laſt diſeaſe had been known, has been brought forward as another argument againſt the identity of the poiſons from which theſe diſorders ariſe. A late writer endeavours to place this matter in a very different point of view, remarking, that if the venereal gonorrhœa remained unnoticed till fifty years after the other forms of the diſeaſe were deſcribed; what does this prove, but that contagious gonorrhœa was ſo common, as to be diſregarded as a ſymptom of the new complaint? Can there be a doubt (ſays Dr. Adams), from the caution given by Moſes, that gonorrhœa was conſidered as contagious in his days? During the claſſical age we find inconveniences of the urinary paſſages were imputed to incontinence, and the police of ſeveral ſtates, before the ſiege of Naples, made laws for preſerving the health of ſuch as would content themſelves with public ſtews, inſtead of diſturbing the peace of families.

In the opinion of the foregoing author, this is enough to leſſen our ſurpriſe that gonorrhœa ſhould be unnoticed for ſome time after the appearance of the venereal diſeaſe. But, according to his ſentiments, ſo far is it from proving the difference of the two contagions, that the faireſt inference we can draw is in favour of their identity. For, if fifty years after the breaking out of ſyphilis, this diſeaſe began to be ſo far underſtood, that ſecondary ſymptoms were found to be the conſequence of primary ones in the genitals, it is moſt probable that the firſt ſuſpicion of venereal gonorrhœa aroſe from the occurrence of ſuch ſecondary appearances, where no other primary ſymptoms could be traced. Adams on Morbid Poiſons, p. 95, edit. 2.

We are glad that this gentleman does not mean theſe obſervations to afford any material ſupport to an argument, which, as he acknowledges, reſts on the baſis of experiment. Every one will coincide with him that gonorrhœas muſt have prevailed from time immemorial, and hence, perhaps, were not regarded as a novelty, or even ſuſpected of being ſyphilitic for many years after the firſt breaking out of lues venerea in Europe. Nor ſhall we diſpute the probability of Dr. Adams's conjecture, that the occurrence of ſecondary venereal ſymptoms, where no primary ones could be traced, excepting a gonorrhœa, cauſed this laſt complaint to fall under the ſuſpicion of being itſelf ſyphilitic. In theſe points we rather agree with the author; but we cannot perceive how they at all warrant an inference in favour of the identity of the virus of the two diſeaſes. The antiquity of gonorrhœas certainly weighs againſt ſuch opinion, inaſmuch as it proves that ſome ſpecies of claps prevailed when the venereal diſeaſe was unknown, and could not poſſibly have any ſhare in their origin. The ſilence of medical writers for fifty years after the venereal diſeaſe was known, in regard to gonorrhœa being a ſymptom of it, undoubtedly militates againſt the identity of the virus producing theſe affections, ſince it tends at leaſt to prove that practitioners were unable all that time to diſcern any evidence in proof of the gonorrhœa depending upon the ſame poiſon as lues venerea. And when the occurrence of ſecondary ſymptoms, apparently unpreceded by any primary ones, excepting a gonorrhœa, firſt gave riſe to the ſuppoſition of this laſt affection being itſelf ſyphilitic, the notion might be erroneous, and the ſecondary venereal complaints admit of explanation in another way. Among the received doctrines concerning lues venerea, the poſſibility of the ſyphilitic virus being abſorbed from the ſurface of the body, without any ulceration of the ſkin, ſeems to have gained the general aſſent of modern practitioners. In this manner buboes, ſore throats, nodes, eruptions, and other ſecondary venereal ſymptoms, may be occaſioned. Such abſorption is the more likely to occur where the cuticle is moiſt and thin. Many caſes, where neither gonorrhœa nor chancre has exiſted, can be explained in no other way; unleſs, indeed, we ſuppoſe the ſore to have been ſo trivial, and to have healed ſo quickly, as to have eſcaped the patient's notice or recollection. Secondary venereal ſymptoms may be produced in either of theſe modes, and yet, though no chancre can be traced, and a gonorrhœa, as happening to be a previous malady, falls under ſuſpicion of being the original cauſe of the conſtitutional complaints, the notion may be on the above account entirely erroneous.

We are aware of the ſentiment entertained by Dr. Adams and many other practitioners, that it is the nature of a chancre to increaſe in all directions till mercury is exhibited. However true this may be as a general obſervation, few ſurgeons of extenſive experience will be perſuaded that there are no exceptions. We have heard it confeſſed by a ſurgeon, who has ſeen as much of the venereal diſeaſe as any man, that ſyphilitic ſores, inſtead of ſpreading to an unlimited extent, will ſometimes heal up without any mercury being given, the diſeaſe afterwards breaking out, however, in another form. Beſides, who can doubt that guaiacum, and ſome other remedies, have healed venereal ſores, though they may not have extirpated the diſeaſe in ſuch manner as to hinder the acceſs of future miſchief? We ſhall preſently find, on the authority of Mr. Pearſon, that even bark, and other articles, will make primary venereal complaints give way, without the aſſiſtance of mercury. Mr. Clutterbuck, in a letter addreſſed to Dr. Adams, makes the following remarks: "I have ſeen caſes which induce me to believe that the venereal diſeaſe, in ſome of its ſtages, and in certain circumſtances, may get well without mercury, or any other remedy. But this is contrary to the doctrine of Mr. Hunter, who ſuppoſed that venereal actions go on increaſing, without any tendency to wear themſelves out.

"That lues venerea is much modified by climate and other circumſtances, is generally allowed; that it has been cured by other means than mercury, we have alſo very ſufficient evidence in the older writers on the ſubject: not to mention the late ſucceſsful trials with acids and other ſubſtances." See Remarks on ſome of the Opinions of John Hunter, &c. by Henry Clutterbuck, p. 27.

Dr. Adams informs us, that according to the laws of morbid poiſons, when a chancre has exiſted and been cured, a perpetual memorial of the event muſt be left, becauſe the ſore heals without granulations. In practice, we have ſo frequently ſeen this obſervation contradicted, that we are ſomewhat ſurprized at its ever having been advanced. Chancres are not only often filled up by granulations before becoming covered with ſkin; but there is actually a redundance of ſuch new ſubſtance, and we are obliged to repreſs it with lunar cauſtic. Mr. Clutterbuck has remarked, in his letter to Dr. Adams, "With reſpect to what you ſuppoſe a law of morbid poiſons, that loſs of ſubſtance in their primary ulcers is never ſupplied, but that ſkinning takes place immediately, as ſoon as the poiſon ceaſes to act, whilſt, in the ſecondary ulcers of theſe diſeaſes granulations as conſtantly take place and ſupply the loſt ſubſtance; I ſuſpect the difference to be rather owing to the nature of the affected parts, according to the greater or leſs readineſs with which they take on and complete the healing proceſs. Thus, for inſtance, in the confluent ſmall-pox, the face alone ſuffers materially from pitting, though the ſkin on other parts has been equally crowded with puſtules, &c. The traces of previous chancre are much more viſible on the glans than on the prepuce." P. 71.

Theſe and other reflections, ſtated in the article GONORRHŒA, make us diſbelieve in the identity of the virus of this malady and lues venerea, as well as the poſſibility of ſecondary venereal ſymptoms ever in reality being the conſequence of any kind of gonorrhœa.

The Hunterian doctrines reſpecting lues venerea produced a ſudden and conſiderable revolution in the theories concerning the nature and treatment of this diſtemper; and, as they are ſtill highly intereſting, and continue to have vaſt influence over modern practice, we feel it our duty to enter a little further into the explanation of them.

The effects produced by the venereal poiſon appeared to Mr. Hunter to ariſe from its peculiar or ſpecific irritation, joined with the aptneſs of the living principle to be irritated by ſuch a cauſe, and the part ſo irritated acting accordingly. He therefore conſidered it as a poiſon, which, by irritating the living parts in a manner peculiar to itſelf, produced an inflammation peculiar to that irritation, and occaſioned the formation of a ſpecific kind of matter, that could alone ariſe from that particular ſort of inflammation. P. 19.

The following ſeems to us a very fair ſummary of the principal opinions promulgated by this philoſophical and original character, on the ſubject of lues venerea.

1. That the venereal poiſon, being taken into the ſyſtem, becomes univerſally diffuſed, and contaminates ſuch parts as are ſuſceptible of the venereal action; and that it is ſoon afterwards expelled the ſyſtem, along with ſome of the excretions.

2. That the parts contaminated do not immediately go into venereal action; but that they acquire a new ſtate, or condition, which is termed a *diſpoſition* to take on the venereal action.

3. That the number of parts contaminated does not depend on the quantity or ſtrength of the virus abſorbed.

4. That the *diſpoſition* once formed in a part, neceſſarily goes on to action at ſome future period.

5. That mercury can cure the *venereal action;* but cannot remove the *diſpoſition* which has been previouſly formed, and has not yet come into action.

6. That although mercury does not deſtroy the diſpoſition already formed, yet that it prevents it from forming.

7. That although the diſpoſition continues, it does not go into action during the uſe of mercury.

8. That the action, having once taken place, goes on increaſing, without wearing itſelf out.

9. That parts once cured never become contaminated again from the ſame ſtock of infection.

10. That the matter of the ſecondary ulcer is not infectious.

11. That the venereal action is as ſoon deſtroyed in a large chancre as in a ſmall one, the mercury acting equally on every part of the ſore.

We ſhall now endeavour to deſcribe the different forms in which ſyphilis preſents itſelf to our notice; we ſhall then introduce ſome general obſervations on the treatment of the diſeaſe; and afterwards conclude with ſuch remarks as ſeem neceſſary to convey the requiſite information reſpecting the management of each particular caſe.

Of Chancres.—Whatever may be the effect ariſing from the application of venereal matter to a ſecreting ſurface uncovered with cuticle, whether gonorrhœa, as Mr. Hunter repreſents, or a ſyphilitic ſore, as Mr. B. Bell has aſſerted, it is admitted by all parties, that when the venereal virus is applied to any part of the common ſkin, a peculiar ſore, called a chancre, is apt to be occaſioned. This, which is the primary venereal ulcer, is generally caught on the parts of generation, in conſequence of a connection between the ſexes; but any part of the body may be affected by the application of venereal matter, eſpecially if the cuticle is thin. In men, chancres uſually occur upon the frænum, glans penis, prepuce, or upon the common ſkin of the body of the penis, the moſt frequent ſituation being the frænum, or corona glandis. The reaſon why chancres commonly affect theſe parts depends upon the manner in which ſuch ſores are caught, and not upon any greater ſpecific tendency in the parts to catch the diſeaſe, than exiſts in other ſituations. They affect the frænum thus frequently, becauſe that part is irregular, and the infectious matter is apt to lie undiſturbed in the folds, by which means it has time to irritate and inflame the place where it lodges, and to produce there the ſuppurative and ulcerative inflammation. On the other-hand, ſince the matter is eaſily rubbed off prominent parts by every thing that touches them, they oftener eſcape the diſeaſe. In leſs common inſtances, chancres are ſeen on the ſcrotum, and even on the ſkin of the pubes.

In women, chancres moſtly take place on the labia and nymphæ. In a few examples they are met with on the perineum. They are generally formed on the inner ſurface of the labia, though ſometimes juſt on their edge, or even on their outſide. Chancres have been obſerved in the vagina; in theſe caſes Mr. Hunter ſuſpected, that the ſores never occupy ſuch ſituation originally; but ariſe there from the ſpreading of ulcers on the inſide of the labia. In women the ulcerations are apt to be more numerous than in men, becauſe the ſurface, for the occurrence of chancres, is more extenſive.

From what has already been obſerved, it muſt be obvious, that chancres may be caught in other ways beſides coition. Whenever venereal matter accidentally comes into contact with any part of the ſkin, where a ſore, cut, or ſcratch exiſts, or whenever ſuch matter is applied where the cuticle is thin and moiſt, a chancre is likely to be the conſequence. Mr. Hunter ſaw on the red part of the lip a chancre, which was as broad as a ſixpence, and caught the patient knew not how; it was attended with bubo under the jaw, and might have been the conſequence of infectious matter inadvertently conveyed to the part by the patient's own fingers. (P. 217.) In Dr. W. Hunter's lectures, mention uſed to be made of a midwife in extenſive practice, who, having caught a chancre on her right fore-finger in examining a pregnant woman that had the diſeaſe, infected no leſs than eighty other women in the courſe of her buſineſs. That ſurgeons occaſionally catch chancres by venereal matter lodging in a ſlight cut, or ſcratch, on their hands or fingers, is univerſally known.

It does not follow, as a matter of certainty, that becauſe venereal matter has been applied to the ſurface of the body, a chancre is ſure to enſue. The thickneſs of the cuticle, no doubt, frequently hinders infection, and the diſeaſe is often prevented by the matter being waſhed or rubbed away. It is believed, that ſome perſons cohabit with diſeaſed women with little riſk, and we are told they are, for the moſt part, ſtrong ſubjects, with a ſhort prepuce, and of courſe the glans always uncovered.

It is a circumſtance worthy of attention, that when a chancre is caught upon the hands or fingers, as related above, the virus ſeems conſtantly to operate more powerfully than when ſuch a ſore is formed in one of the uſual ſituations. "I know a midwife," ſays Swediaur, "who having been infected in this manner ſeveral years ago, ſtill ſuffers from the diſeaſe; and we have another inſtance in this metropolis of an eminent male practitioner in the ſame art, who, by delivering an infected woman got ulcers in his hand, and at this preſent time ſtill labours under the conſequences, though it is now three years ſince he received the infection. I know a gentleman, who wounding his finger by accident with a pen-knife, expoſed it the ſame evening to infection, without ſuſpecting any bad conſequences; the wound changed in two days to a very bad venereal ulcer, accompanied with a painful and obſtinate ſwelling of the whole arm, together with a bubo under the arm-pit, and ſymptoms of a general infection." Practical Obſervations on Venereal Complaints, p. 194, edit. 2.

The time, which elapſes between the application of the virus and the appearance of a chancre, is exceedingly different in different caſes, depending however, in ſome meaſure, on the nature of the part affected. According to Mr. Hunter, the diſeaſe generally begins earlier in the frænum, or termination of the prepuce in the glans, than on the glans itſelf, the ſcrotum, or the common ſkin of the penis. This celebrated ſurgeon was acquainted with examples, in which chancres made their appearance as early as twenty-four hours after infection; but on the other hand, he mentions inſtances in which ſuch ſores did not begin till ſeven or eight weeks after the application of the virus.

The inflammation which precedes a chancre, like moſt other inflammations which terminate in ulcers, begins firſt with an itching in the part. If it is the glans that is inflamed, a ſmall pimple generally appears full of matter, without much hardneſs, or ſeeming inflammation, and with very little tumefaction, the glans not ſwelling ſo much from inflammation as many other parts do, eſpecially the prepuce. Chancres on the glans are alſo leſs painful and annoying than thoſe on the prepuce. When, however, an ulcer of this kind affects the frænum, or in particular the prepuce, the inflammation is more extenſive and viſible. The itching gradually changes into pain. In ſome caſes the ſurface of the prepuce is firſt excoriated, and ulceration afterwards takes place; while, in other inſtances, a ſmall pimple or abſceſs is the forerunner of the ulcers as on the glans. The ſore becomes ſurrounded by a thickening, which, at firſt, and while of the true venereal kind, is very circumſcribed, and inſtead of diffuſing itſelf imperceptibly into the ſurrounding parts, has rather an abrupt termination. The baſe of a chancre is hard, and the edges ſomewhat prominent. When the ſore begins on, or near the frænum, it often happens that this part is quite deſtroyed, or elſe a hole is made through it by the ulceration. Hunter, p. 218, 219.

The indurated baſe, or ſurrounding thickening of a chancre, is a moſt remarkable ſymptom, and one to which ſurgical writers exhort us to pay conſiderable attention; for if the chancre heal, and a hardneſs remain, it will either break out again, when the conſtitution becomes infected, or the hardneſs will ſtill be increaſed, as ominous and indicative of a conſtitutional infection. "This ſymptom, therefore, will always explain, by its preſence, that the local infection is not radically removed; and by its abſence that it is." If, by embracing the part, which was the ſeat of the chancre, the appearance be thin, ſo that the finger and thumb do almoſt meet, the cure may then be concluded to be perfect; but if a hardneſs and thickneſs remain, although it be healed, and if there be a ſcale upon the part where the chancre was, then the caſe muſt be deemed as not cured, and as requiring much more to be done for it." Foot on Lues Venerea, p. 413.

When chancres occur on the ſcrotum, or body of the penis, they generally firſt appear in the form of a pimple, which turns to a ſcab, and this being rubbed off, is ſucceeded by a larger one. Chancres, thus ſituated, are attended with leſs inflammation than ſuch as take place on the frænum or prepuce; but with more than thoſe on the glans.

When the diſeaſe advances, it ſometimes partakes of the inflammation peculiar to the habit, and becomes more diffuſed, ſo as to produce phymoſis, paraphymoſis, and other diſagreeable complaints, which tend to retard the cure.

The local or immediate effects of the venereal diſeaſe are ſeldom wholly ſpecific, but partake of the conſtitutional inflammation. The firſt appearance and progreſs of chancres, therefore, ſhould be watched, as the nature of the conſtitution may thereby be aſcertained. If, ſays Mr. Hunter, the inflammation ſpreads faſt and conſiderably, it ſhews a conſtitution more diſpoſed to inflammation than natural. If the pain is great, it ſhews a ſtrong diſpoſition to irritation. A ſtrong tendency to mortification is alſo ſometimes betrayed by chancres beginning in an early ſtage to form ſloughs.

According to Mr. Hunter, venereal ulcers have no diſpoſition to heal, which, generally ſpeaking, is undoubtedly true. We may add, that the edges of a chancre are commonly jagged and vertical, inſtead of ſhelving, like thoſe of moſt other ſores; and its ſurface, before the adminiſtration of remedies, is ſmeared with a greyiſh viſcid matter, which is in very ſmall quantity, and ſaid to have a peculiar ſmell. If a bit of lint is applied to the ſore in this ſtate, it becomes adherent to the part, the matter ſecreted not being enough to moiſten and looſen the connection.

When there is a conſiderable loſs of ſubſtance, either from ſloughing or ulceration, a profuſe bleeding is no uncommon circumſtance, more eſpecially if the ulcer is on the glans, the blood eſcaping from the corpus ſpongioſum urethræ. The ulcers, or ſloughs, often go as deep as the corpus cavernoſum penis, and give riſe to ſtill more copious hemorrhages.

A ſurgeon ſhould never be too haſty in pronouncing ſores to be chancres; the genitals, the common ſeat of a chancre, are, "like every other part of the body, liable to diſeaſes of the ulcerative kind, and from ſome circumſtances rather more ſo than other parts, for if attention is not paid to cleanlineſs, we have often excoriations, or ſuperficial ulcers from that cauſe; alſo, like every other part that has been injured, theſe parts, when once they have ſuffered from the venereal diſeaſe, are very liable to ulcerate anew." Hunter, p. 215.

Until ſome of the virus has been abſorbed from the ſurface of a chancre, ſuch ſore is to be regarded as entirely a local affection. Unfortunately, the time when this abſorption happens can never be exactly known, ſo that, in the earlieſt ſtage of the ulcer, moſt practitioners are fearful of acting, altogether, as if there were no poſſibility of the conſtitution being already contaminated.

Some conſequences of chancres will be hereafter ſpoken of.

Of Buboes.—A venereal bubo is an inflammation of an abſorbent gland, and ariſes from the abſorption of the ſyphilitic virus, which, in being conveyed from the ſurface to which it was firſt applied, towards the trunk of the lymphatic ſyſtem, has to paſs through glands, and in doing this, it often makes theſe parts inflame and ſuppurate. Venereal matter may be taken up by the abſorbents under various circumſtances. The leaſt frequent way is where it has only been applied to ſome ſound ſurface, without having produced any local effect on the part, but has been abſorbed immediately upon its application. According to Mr. Hunter, another mode of abſorption is where ſome of the matter of a gonorrhœa is taken up by the lymphatics, and carried into the circulation. A third mode is the abſorption of the matter from an ulcer, and is by far the moſt common. A fourth way is the abſorption from a wound. Mr. Hunter, perhaps, with great propriety, uſed to call every abſceſs in the abſorbing ſyſtem, ariſing in conſequence of the abſorption of venereal matter, a bubo, whether in the veſſels or the glands themſelves.

As theſe veſſels and glands are immediately irritated by the ſpecific virus before it has undergone any change in its paſſage, the conſequent inflammation muſt, therefore, have the ſame ſpecific quality, and the matter ſecreted in the ſwelling be venereal.

In conſidering the ſubject of buboes, Mr. Hunter divided the abſorbent ſyſtem into the veſſels themſelves, and into their convolutions, or lymphatic glands.

The abſorbent veſſels are not ſo often inflamed as the glands, but when they are thus affected, in conſequence of a chancre upon the glans, or prepuce, they generally appear like a hard cord, running from the ſore along the dorſum of the penis. Such inflammations of the lymphatics ſometimes ariſe from a thickening of the prepuce in caſes of gonorrhœa, that part being uſually at the time in a ſtate of excoriation. Theſe cords often terminate inſenſibly near the root of the penis, or the pubes. In other inſtances they extend further to a lymphatic gland in the groin.

The lymphatics, thus inflamed in conſequence of imbibing venereal, or, at leaſt, irritating matter, often ſuppurate, and this ſometimes in ſeveral places, ſo as to produce as many buboes, or ſmall abſceſſes, on the body of the penis.

Inflammation of the lymphatic glands is much more frequent than the foregoing affection, and is cauſed by the venereal matter being carried into them. The ſtructure of theſe parts appears to conſiſt of the ramifications of lymphatic veſſels, which, after branching it, re-unite again. We may infer, from this kind of arrangement, that the fluid abſorbed is, in ſome meaſure, detained in the glands, and thereby has a greater opportunity of communicating the diſeaſe to them, than to the lymphatic veſſels, through which its courſe is probably more rapid.

Since the lymphatic glands are liable to inflame from many different cauſes, ſurgeons ſhould be careful to diſcriminate ſuch ſwellings as ariſe from the venereal poiſon, from others of a diverſe nature. They ſhould firſt enquire, whether there is any venereal complaint at a greater diſtance from the heart, as chancres on the penis, or, whether there has been any preceding diſeaſe in ſuch ſituation. They ſhould enquire, whether any mercurial ointment has been rubbed on the leg or thigh of the affected ſide, as mercurial frictions, thus practiſed for the cure of a chancre, will ſometimes give riſe to a glandular ſwelling in the groin, that may be erroneouſly taken for a venereal bubo. We are alſo adviſed by Mr. Hunter to obſerve, whether there has been any previous diſeaſe in the conſtitution, as a cold, fever, &c. He directs us, moreover, to pay attention to the quickneſs, or ſlowneſs, with which the tumour has formed, and warns us of the poſſibility of miſtaking a rupture, lumbar abſceſs, and an aneuriſm of the crural artery, for a bubo.

Some caſes ſeem to evince, that a bubo ſometimes does not begin till ſeveral days, and even longer, after the virus has been abſorbed, the chancres having been healed this length of time, before the gland begins to inflame.

The glands neareſt to the ſeat of abſorption are, in general, the only ones attacked. Thus, when venereal matter is abſorbed from a ſore on the penis, the glands in the groin are in danger of being affected. When the matter is abſorbed from the vulva in women, the glands liable to be inflamed, are thoſe ſituated between the labium and thigh, and the round ligament.

Mr. Hunter believed, that, commonly, only one gland is affected at a time by the abſorption of venereal matter, and he ſuggeſts this circumſtance as a diſtinguiſhing mark between venereal buboes and other diſeaſes of the lymphatic glands.

The abſorbent veſſels and glands, ſituated beyond the firſt order of glands, or ſuch as are neareſt to the ſeat of abſorption, are never affected. Hence, thoſe near the iliac veſſels and back always eſcape the effects ariſing from the abſorption of venereal matter from the genitals. It is alſo obſerved by Mr. Hunter, that when the diſeaſe has been contracted by a cut, or ſore upon the finger, the bubo takes place a little above the bend of the arm, upon the inſide of the biceps muſcle; and that, when ſuch bubo has occurred, none is, in general, produced in the arm-pit, which is the moſt common place for the glands to be affected by abſorption. This celebrated ſurgeon, however, mentions two rare exceptions, in which buboes occurred as well in the arm-pit as above the elbow.

Mr. Hunter once ſuſpected, that the reaſon of the ſecond and third ſeries of glands not being affected, might be owing to a change produced in the matter by the firſt glands, through which the virus paſſes. Reflecting, however, that the matter of a bubo is infectious, like that of a chancre, and that ſome of it can hardly fail to be taken up by the abſorbents, he perceived that the above explanation failed. He therefore altered his ſentiment, and concluded, that the internal ſituation of the glands, more remote from the ſeat of abſorption than the firſt order, might prevent the venereal irritation from taking place in them. We may remark, that this reaſoning will not account for the occaſional production of a bubo in the arm-pit above another at the bend of the arm. It is poſſible, however, that, in this laſt kind of caſe, ſome of the virus from the chancre on the finger may arrive at the axilla, without being conveyed at all through the abſorbent glands, which are ſituated at the inner ſide of the arm, a little above the internal condyle.

In men, buboes from a venereal complaint on the penis are ſituated in the groin. Mr. Hunter, we know, comprehended gonorrhœa among the cauſes, and, in this caſe, he thought, that both groins were equally expoſed to bubo. When the ſwelling in the groin originates from a chancre, it is generally on that ſide of the body to which the ſore is neareſt, though caſes happen which are exceptions to this obſervation, and admit of explanation by the anaſtomoſes of the lymphatics.

Mr. Hunterappriſes us, that the inguinal glands are not conſtantly arranged in one exact manner, and that, therefore, the courſe of the abſorbent veſſels muſt be ſubject to variety. Hence a bubo, from a venereal ſore on the penis, has been a conſiderable way down the thigh, or in front of Poupart's ligament, or near the pubes.

As, in men, chancres are almoſt always caught upon the penis, ſo buboes in them are commonly ſituated in the groins; but we have already noticed, that chancres occaſionally form in other parts of the body, and, of courſe, buboes are not neceſſarily confined to one ſituation, the neareſt external glands, between the heart and the ſeat of abſorption, every where in the body, being liable to ſhare the ſame fate as thoſe in the groin.

When buboes ariſe in women, unpreceded by any chancre, it is more difficult to find out whether they are venereal or not, than in men. For, in the latter examples, when they ariſe without any local complaint, it is known that no ſuch complaint exiſts, and, therefore, that the bubo cannot be venereal, except by immediate abſorption from a ſound ſurface. But, ſays Mr. Hunter, in women, it is often difficult to diſcover whether any infection is preſent or not; and the nature of the bubo can only be made out by paying attention to the way in which it began, its progreſs, and other circumſtances.

When chancres are ſituated near the meatus urinarius, nymphæ, clitoris, labia, or mons veneris, the abſorbed matter is carried along one or both of the round ligaments, and the buboes are formed in thoſe ligaments, juſt before they enter the abdomen. Mr. Hunter believed that they never extended further, and he ſuppoſed them to be inflammations of veſſels, and not of glands. When chancres are ſituated far back, near or in the perineum, the abſorbed matter is carried forwards, along the angle between the labium and the thigh, to the glands in the groin. Throughout this courſe ſmall buboes may occur; or the virus, entering the inguinal glands, a bubo in the groin is frequently produced.

The bubo, ſays Mr. Hunter, commonly begins with a ſenſe of pain, which leads the patient to examine the part, where a ſmall hard tumour is to be felt. This increaſes, like every other inflammation that has a tendency to ſuppurate; and, unleſs prevented, it goes on to ſuppuration and ulceration, the progreſs of the matter to the ſkin being very quick. There are, indeed, ſome caſes which are ſlow in their progreſs: in theſe, Mr. Hunter thought the inflammatory proceſs was kept back by mercury, or other means; or elſe retarded by a ſcrofulous tendency, ſuch a diſpoſition in the parts not ſo readily admitting the true venereal action.

At firſt, the inflammation is confined to the gland, which is moveable in the cellular membrane; but as the ſwelling increaſes in ſize, or as the inflammation, and, more eſpecially, the ſuppuration advance, the ſpecific diſtance is exceeded, the ſurrounding cellular membrane becomes more inflamed, and the tumour is more diffuſed. Some buboes become eryſipelatous, by which means they are rendered more diffuſed and œdematous, and do not readily ſuppurate.

The following is then, according to Mr. Hunter, the true character of a venereal bubo: it is confined to one gland; it keeps within the ſpecific diſtance, till ſuppuration has taken place, and then becomes more diffuſed. It is rapid in its progreſs from inflammation to ſuppuration and ulceration. In general, the ſuppuration is copious, conſidering the ſize of the tumour, and the abſceſs is ſingle. The pain is very acute, and the inflamed ſkin exhibits a florid red colour.

Where no local diſeaſe has exiſted, the nature of a bubo will always be attended with more uncertainty, than when there has been ſome diſeaſe on the penis. As, however, every inflammation of the inguinal glands is ſuſpected, the patient runs but little riſk of not being cured if his caſe is venereal; but, (continues Mr. Hunter,) "I am afraid, that patients have often undergone a mercurial courſe, when there has been no occaſion for it." P. 266.

The ſame diſtinguiſhed practitioner thought, that there were two ſorts of buboes ariſing without any viſible cauſe. One kind inflame and ſuppurate briſkly, as thoſe buboes uſually do which ariſe from chancres, or gonorrhœa. The manner of their progreſs made him always ſuſpect them to be venereal

The ſecond kind are generally preceded and attended with ſlight fever, or the common ſymptoms of a cold, and they are generally indolent and ſlow in their progreſs. If they are more quick than ordinary, they become more diffuſed than the venereal, and probably are not confined to one gland. When very ſlow, they give but little ſenſation; and though the ſenſation is more acute when they are quicker, yet it is not ſo ſharp as in the true venereal bubo. Beſides, they do not commonly ſuppurate; but become ſtationary. When they do ſuppurate, it is ſlowly, and often in more glands than one, the inflammation being more diffuſed, and yet not very ſevere, conſidering the ſize of the ſwelling. The matter makes its way to the ſkin ſlowly, unattended with much pain, and the colour of the ſwelling is ſomewhat purple, inſtead of the florid redneſs which the ſurface of the venereal bubo diſplays. Sometimes the abſceſſes are very conſiderable; but then they are not painful.

In judging of the nature of a bubo, Mr. Hunter recommends us firſt to conſider, whether or not there are any venereal complaints exiſting. If there are none, this is a preſumptive proof, that the glandular ſwelling is not venereal. If the tumour is only in one gland, very ſlow in its progreſs, and gives but little pain, it is likely to be ſcrofulous. If the ſwelling is conſiderable, diffuſed, and attended with ſome inflammation and pain, then, in all probability, a conſtitutional action prevails, attended with laſſitude, loſs of appetite, want of ſleep, ſmall quick pulſe, &c. Such ſwellings, (adds Mr. Hunter,) are ſlow in their cure, and are not affected by mercury, even when it is applied very early.

This gentleman likewiſe adverts to other caſes, which he terms mixed, when the venereal matter, like a cold, or fever, has only irritated the glands to diſeaſe, producing in them ſcrofula, to which they were prediſpoſed. In theſe examples, the ſwellings commonly ariſe ſlowly, give but little pain, and ſeem rather to be haſtened in their progreſs, if mercury is given with a view of deſtroying the venereal diſpoſition. Some ſuppurate under ſuch treatment, while others, which probably had a venereal taint at firſt, become ſo indolent, that mercury has no effect at all upon them, and in the end, they either get well of themſelves, or by other remedies. See Hunter on Ven. Diſeaſe.

With reſpect to the bubo which ariſes from gonorrhœa, we believe it is only ſympathetic, or the conſequence of irritation, though, as we have already ſtated, Mr. Hunter looked upon ſome of theſe caſes as actually venereal, and originating from the abſorption of the gonorrhœal matter.

Dr. Adams avers, that he is unacquainted with any inſtance in which the conſtitution has become affected in conſequence of a bubo, without a previous chancre, or gonorrhœa; for the reader ſhould underſtand, that even a venereal bubo does not imply a general contamination; the virus is only on its way towards the circulation, when it gives riſe to the ſwelling in the groin. Dr. Adams moreover aſſures us, that he has never ſeen reaſon to repent the not having treated ſuch buboes as venereal. "If," (ſays this gentleman,) "a bubo has been the conſequence of an ulcer on the penis, which healed ſpontaneouſly, we may be certain that it is not venereal. It may be the effect of a morbid poiſon, as probably many of Celſus's were; it may be aſſiſted by, and even heal under, the uſe of mercury; but this will be no proof of its venereal origin." On Morbid Poiſons, p. 128. 2d edit.

Some additional remarks on buboes will be introduced when we conſider the treatment.

Of Secondary, or Conſtitutional Symptoms.—By ſecondary, or conſtitutional ſymptoms, are commonly underſtood thoſe effects which ariſe from the ſyphilitic virus being abſorbed and carried into the common circulation. It is moſt likely, that in caſes of chancre, the contamination of the ſyſtem takes place about the beginning of the local complaints; for, in moſt inſtances, the chance of ſuch infection happening afterwards is greatly leſſened, by the patient having ſpeedy recourſe to the uſe of mercury, which generally acts as a preventive.

The abſorption of venereal matter into the ſyſtem moſtly ariſes from a chancre, and Mr. Hunter joined in the belief, that it may alſo ſometimes originate from a gonorrhœa. We have already adverted to the opinion, that the virus may poſſibly be obſerved, in ſome inſtances, without there being any ſore at all produced in the ſeat of abſorption, that is, where the matter is applied. Mr. Hunter thought, that this might happen upon a half-internal ſurface, like that of the glans penis, though, perhaps, not on the ſound ſkin. Venereal matter may likewiſe be received into the conſtitution by being applied to common ulcers, although not neceſſarily rendering theſe ulcers themſelves venereal. Wounds alſo afford a ſurface for ſuch abſorption, but Mr. Hunter believed, that ulceration was always firſt produced.

Some parts of the body are much leſs ſuſceptible of lues venerea than others; and many parts, as far as preſent evidence extends, ſeem quite incapable of being affected. Mr. Hunter never ſaw the brain, heart, ſtomach, liver, kidnies, &c. thus diſeaſed. This celebrated writer divides the parts which are capable of becoming contaminated, in conſequence of the abſorption of the virus into the circulation, into two orders. The firſt order conſiſts of the ſkin, tonſils, noſe, throat, inſide of the mouth, and ſometimes the tongue. Theſe are the parts commonly affected at an early period, after the paſſage of the virus into the conſtitution. The ſecond order conſiſts of the perioſteum, faſciæ, tendons, and bones; parts which become diſeaſed leſs early.

Mr. Hunter, with much appearance of reaſon, has endeavoured to account for this ſeeming greater ſuſceptibility in ſome parts than others, by the manner in which the former are expoſed to cold. Thus, he obſerves, the ſkin is continually ſubjected to more cold than the internal parts are; and the venereal diſeaſe always more readily affects parts ſo expoſed than others. This may be the reaſon why the mouth, noſe, and ſkin are affected with particular frequency, and alſo why the perioſteum, and moſt ſuperficial ſurfaces of the bones, are moſt liable to be diſeaſed. The diſtemper, however, ſeems to ſhew ſome preference to ſuch bones as are particularly hard.

In treating of chancres and buboes, we had occaſion to obſerve, that the matter, in both theſe caſes, partook of the ſpecific quality, and, of courſe, was capable of communicating the diſeaſe. We have now to notice, that this is not the caſe with the matter of ſecondary venereal ulcers, or ſuch as ariſe in conſequence of the introduction of the virus into the ſyſtem at large. Indeed, none of the ſecondary ſymptoms are infectious. As Mr. Hunter has ſtated, this form of the diſeaſe has not the power of contaminating parts, not already under its influence, even in the ſame conſtitution. Probably, the poiſon only irritates juſt after its abſorption, and is ſoon expelled with ſome of the ſecretions, inſtead of circulating with the blood during the whole time of the diſeaſe.

Mr. Hunter has concluded one of his moſt intereſting chapters with the following inferences.

Firſt; that moſt parts, if not all, that are affected in the lues venerea, are affected with the venereal irritation at the ſame time.

Secondly; that parts expoſed to cold are the firſt that admit the venereal action; then the deeper parts, according to their ſuſceptibility for ſuch action.

Thirdly; the venereal diſpoſition, when once formed in a part, muſt neceſſarily go on to form the venereal action.

Fourthly; that all parts of the body, under ſuch diſpoſition, do not run into action equally faſt, ſome requiring ſix or eight weeks, others as many months.

Fifthly; in the parts that come firſt into action, the diſeaſe goes on increaſing, without wearing itſelf out; while thoſe which are ſecond in time, follow the ſame courſe.

Sixthly; mercury hinders a diſpoſition from forming; or, in other words, prevents contamination.

Seventhly; mercury does not deſtroy a diſpoſition already formed.

Eighthly; mercury hinders the action from taking place, although the diſpoſition be formed.

Ninthly; mercury cures the action.

Secondary Venereal Ulcers.—Theſe are of a very different nature from chancres, or ſuch ſores as originate directly from the application of venereal matter to the ſkin. They are generally much leſs painful than the latter, attended with leſs inflammation, and do not ſecrete matter, that can communicate the diſeaſe to others, or cauſe buboes in the patient himſelf. They are more readily formed on mucous membranes, than on the common integuments, and therefore are very frequent on the tonſils, and other parts of the throat. Sores of this deſcription are often of a round ſhape, though, in certain examples, they eat away the parts, like herpetic or phagedenic ulcers, ſpreading from one part to another, deſtroying the ſkin, and healing on one ſide, while they are extending themſelves on another. Richeraud has ſeen ulcers of this kind, ſpread in this manner nearly all over the patient's body, producing one vaſt cicatrix; and he adverts to a particular ſpecies of ſecondary venereal ulcer, which is of a round ſhape, and begins to heal at its centre, ſo that towards the termination of the complaint the ſore repreſents an ulcerated circle, encompaſſing a round cicatrix. When this variety of the diſeaſe makes progreſs, the ulcerated ring becomes larger, while the cicatrix in the centre undergoes a proportional increaſe in ſize. (Noſ. Chirurg. tom. i. p. 331, 332. edit. 2.) It may be doubted whether the latter caſes are really ſyphilitic: they certainly yield to many remedies beſides mercury, as our own obſervation has convinced us. They may be cured by guaiacum, nitric acid, a decoction of ſarſaparilla, and elm bark, &c.

Venereal Eruptions.—On this ſubject Mr. Hunter has pointed out to us the following circumſtances.

The appearances on the ſkin generally occur all over the body. The diſcolourations make the ſkin appear mottled, and many of the eruptions diſappear, while others continue, and increaſe with the diſeaſe.

In other caſes, the eruption comes on in diſtinct blotches, which are often not obſerved till the ſcurfs have begun to form. At other times, the eruption aſſumes the appearance of ſmall diſtinct inflammations, containing matter, and reſembling pimples, not being, however, ſo pyramidal, nor ſo red at the baſe. Mr. Hunter alſo obſerves, that venereal blotches, on their firſt coming out, are often attended with inflammation, which gives them a degree of tranſparency, which is generally greater in the ſummer than the winter, eſpecially if the patient be kept warm. In a little time this inflammation diſappears, and the cuticle peels off in the form of a ſcurf. The latter occurrence often miſleads the patient and the ſurgeon, who look upon this dying away of the inflammation as a decay of the diſeaſe, till a ſucceſſion of ſcurfs undeceives them. Mr. Hunter adds, that the diſcolourations of the cuticle ariſe from the venereal irritation, and are to be ſeldom regarded as a true inflammation, ſince they rarely have any of its characteriſtics, ſuch as tumefaction and pain. However, he explains that in parts which are well covered, or which are conſtantly in contact with other parts, there is more of the true inflammatory appearance, eſpecially about the anus.

The parts affected next begin to alter their appearance, and form a copper-coloured, dry, inelaſtic, cuticle, called a ſcurf. This is thrown off, and new ones are formed. Mr. Hunter relates, that theſe appearances ſpread to the breadth of a ſixpence, or ſhilling; but ſeldom more extenſively, at leaſt for a conſiderable time. In the mean while, every ſucceeding ſcurf becomes thicker and thicker, till at laſt it becomes a common ſcab. Then the diſpoſition for the formation of matter takes place in the cutis underneath, and a true ulcer is formed, which commonly ſpreads, although in a ſlow way.

Theſe appearances ariſe firſt from the gradual loſs of the true ſound cuticle, which the diſeaſed cutis cannot re-produce. As a kind of ſubſtitute for this want of cuticle, an exudation takes place, and forms a ſcale. The matter afterwards acquiring more conſiſtence, at laſt forms a ſcab. However, before the diſeaſe has attained this condition, the cutis has ulcerated, after which the diſcharge is more like true pus. When this form of the lues venerea attacks the palms of the hands and ſoles of the feet, where the cuticle is thick, this latter part firſt becomes ſeparated, and peels off. A new one is immediately formed, which alſo ſeparates. In this manner, a ſeries of new cuticles take place, in conſequence of ſcurfs not being ſo readily formed as on the common ſkin. When the diſeaſe is confined to the palms of the hands, or ſoles of the feet, Mr. Hunter mentions, that there is difficulty in determining whether it is venereal or not: becauſe moſt diſeaſes of the cutis, in theſe ſituations, produce a ſeparation of the cuticle, attended with the ſame appearances in all, and having nothing characteriſtic of the venereal diſeaſe.

When the affected part of the ſkin is oppoſed by another portion of ſkin, which keeps it in ſome degree more moiſt, as between the nates, about the arms, between the ſcrotum and the thigh, in the angle between the two thighs, on the red part of the lip, or in the arm-pits, the eruptions, inſtead of being attended with ſcurfs and ſcabs, become accompanied by an elevation of the ſkin, which is ſwollen with extravaſated lymph into a white, ſoft, moiſt, flat ſurface, which diſcharges a white matter.

A venereal eruption often attacks that part of the fingers on which the nail is formed. Here the diſeaſe renders that ſurface red, which is ſeen ſhining through the nail; and if allowed to continue, a ſeparation of the nail takes place, ſimilar to that of the cuticle in the above caſes. However, Mr. Hunter ſtates, that there cannot be the ſame regular ſucceſſion of nails, as of cuticles in other inſtances.

Such ſurfaces of the body as are covered with hair may alſo be attacked, and the hair ſeparates, and cannot be produced as long as the diſeaſe laſts.

Venereal Affections of the Parts about the Throat.—According to Dr. Adams, the venereal ulcer in the throat is always, what may be termed, a foul ulcer. Though its edges are defined, its ſurface is always ragged and uneven, of a complexion which can never be miſtaken for a clean or healthy ſore, that is, for a ſore diſpoſed to heal. The pus is of various colours, from the aſh-colour to the duſky brown. From the nature of the parts, a ſcab cannot be formed, ſo that the ulcerous appearance is never interrupted. Its progreſs is more rapid than on the ſkin, as every action of inflammation, ulceration, or healing, is always more rapid in theſe very ſanguiferous parts. It is rarely attended with pain. On Morbid Poiſons, p. 167. edit. 2.

When the throat, tonſils, or inſide of the mouth, are affected, it is the nature of the diſeaſe to make its appearance at once in the form of an ulcer, without much previous ſwelling.

The venereal ſore-throat ſhould be moſt carefully diſcriminated from others, a thing that is not always at firſt very eaſy; for ſores in this ſituation, which are really ſyphilitic, ſometimes have much the ſame appearance as others which are not ſo. It is the character, however, of a venereal ſore-throat to begin with ulceration of the ſurface of the parts. Now, as Mr. Hunter has explained, it is the nature of ſeveral other diſeaſes, in the ſame ſituation, not to produce directly this kind of ulceration. One of theſe is common inflammation of the tonſils. The inflamed place often ſuppurates in the centre, ſo as to form an abſceſs, which burſts by a ſmall opening; but never looks like an ulcer, that has begun upon the ſurface, like a true venereal ſore. The caſe, juſt now mentioned, is always attended with too much inflammation, pain, and ſwelling of the parts, to be venereal. Alſo, when it ſuppurates and burſts, it ſubſides directly, and it is generally attended with other inflammatory ſymptoms in the conſtitution.

Notice is likewiſe taken, by this moſt celebrated ſurgeon, of an indolent tumefaction of the tonſils, which is peculiar to many perſons of a ſcrofulous conſtitution. The complaint occaſions a thickneſs of ſpeech.

Sometimes coagulable lymph is thrown out on the ſurface of the parts affected, and produces appearances which are by ſome called ulcers, by ſome ſloughs, and occaſionally by others, putrid ſore-throats. The caſe is attended with too much ſwelling to be venereal; and, with a little care, it may eaſily be diſtinguiſhed from an ulcer, or loſs of ſubſtance. However, when this difference is not obvious at firſt ſight, it is proper to endeavour to remove ſome of the lymph, and if the ſurface of the tonſil underneath ſhould appear to be free from ulceration, we may conclude, with certainty, that the diſeaſe is not venereal. Mr. Hunter ſtates, that he has ſeen a chink filled with coagulable lymph, ſo as to appear very much like an ulcer; but, on removing that ſubſtance, the tonſil underneath was found perfectly ſound. He adds, that he has ſeen caſes of a ſwelled tonſil, having a ſlough in its centre, which ſlough, before its detachment, looked very like a foul ulcer. The ſtage of the complaint, he ſays, is even more puzzling, when the ſlough has come out; for then the diſeaſe has moſt of the characters of the venereal ulcer. Whenever he met with the diſeaſe in its firſt ſtage, he always treated it as if it had been of the nature of eryſipelas, or a carbuncle. When the complaint is in its ſecond ſtage, without any preceding local ſymptoms, he recommends the practitioner to ſuſpend his judgment, and to wait a little, in order to ſee how far Nature is able to relieve herſelf. If there ſhould have been any preceding fever, the caſe is ſtill leſs likely to be venereal. Mr. Hunter informs us, that he has ſeen a ſore-throat of this kind miſtaken for venereal, and mercury given till it affected the mouth, when the medicine brought on a mortification of all the parts concerned in the firſt diſeaſe.

Another complaint of theſe parts, which Mr. Hunter repreſents as being often taken for a venereal one, is an ulcerous excoriation, which runs along their ſurface, becoming very broad and ſometimes foul, having a regular termination, but never going deeply into the ſubſtance of the parts, as the venereal ulcer does. No part of the inſide of the mouth is exempted from this ulcerous excoriation; but Mr. Hunter thought, that the diſeaſe moſt frequently occurred about the root of the uvula, and ſpread forwards along the palatum molle. He remarks, that the complaint is evidently not venereal, ſince it does not yield to mercury. He has ſeen theſe ulcerous excoriations continue for weeks, without undergoing any change, and a true venereal ulcer makes its appearance on the ſurface of the excoriated part. He ſays, that the excoriations in queſtion have been cured by bark, after the end of the mercurial courſe, which cured the ſyphilitic ſore.

This author deſcribes the true venereal ulcer in the throat as a fair loſs of ſubſtance, part being dug out, as it were, from the body of the tonſil; it has a determined edge, and is commonly very foul, having thick white matter, like a ſlough, adhering to it, and not admitting of being waſhed away. Ulcers in ſuch ſituations are always kept in a moiſt ſtate, and the matter cannot dry and form ſcabs, as it does on ſores upon the ſkin. The ulcer is alſo much more rapid in its progreſs, and generally has thickened edges. Hunter on Venereal Diſeaſe.

Dr. Adams, after reminding us not to conſider every ragged ulcer of the throat as certainly venereal, takes occaſion to remark, that he has ſeen more than one of this deſcription, which has healed whilſt he has been making up his mind, whether he ſhould ſalivate his patient. He ſays, "the only diſtinction I know between theſe and true venereal ulcers, is that the former are uſually attended with more pain, the edge is alſo for the moſt part leſs defined, and the ſurface itſelf is more irregular; the fever too, if any attends, is not ſuch as we have deſcribed in ſyphilis. But the venereal ulcer is not always entirely free from pain, and there is generally ſome irregularity in its ſurface; the fever too, we have remarked, is often ſlight. Happily, this intricacy does not often occur, but often enough to teach us not to value ourſelves on a haſty deciſion, when a little delay will be unattended with danger, and perhaps ſave our patient a tireſome and unneceſſary proceſs. By watching the ulcer attentively, we ſhall be able to obſerve whether it continues to ſpread regularly, though ſlowly, ſtill retaining its character, and not healing in any part. If this ſhould continue a few days, we ſhall have no reaſon to doubt its ſyphilitic character; but if the progreſs is ſlow, there can be no harm in a further delay, the only inconvenience attending which, will be the importunity of your patient. If, as is ſometimes the caſe, from the nature of the part, and the irritability of the conſtitution, the progreſs of the ulcer ſhould be quicker, the character in all other reſpects well defined, and the hiſtory of the caſe leading to a ſimilar concluſion, we may, by uſing every poſſible means of introducing mercury, eaſily accelerate our courſe. This will rarely be very difficult, becauſe the ſame irritability of conſtitution which produces an ulceration more rapid than uſual, is for the moſt part attended with quicker ſuſceptibility of the mercurial irritation.

"The ſame directions are applicable, whether the ulcer is ſeated on the tonſils, uvula, or palatum molle, or any of the neighbouring parts, excepting the tongue, in which caſe the progreſs is ſlower, the edges conſequently thicker from the ſtructure of the part, and the pain and inconvenience greater from the ſame cauſes, and alſo from its particular offices." (Adams on Morbid Poiſons, p. 167, 168.) According to Mr. Hunter, lues venerea ſometimes produces a thickening and hardening of the tongue. We have ſeen a caſe or two, in which this part has been ſtudded over with largiſh tubercles, or hard lumps, which yielded to mercury. We doubt, however, whether theſe inſtances were really ſyphilitic.

Venereal Affections of the Bones, Perioſteum, Faſciæ, and Tendons.—Nodes-ſyphilitic Pains.—Theſe complaints are nodes and pains in the bones. A ſwelling of the parts enumerated, originating from a ſyphilitic cauſe, receives the appellation of a node. We have already obſerved, that Mr. Hunter divided the parts in which ſecondary ſymptoms manifeſt themſelves into two orders; the firſt comprehending the ſkin and parts about the throat and mouth; the ſecond, the bones, perioſteum, faſciæ, and tendons. Theſe latter ſtructures do not in general become affected till the diſeaſe has troubled the patient a conſiderable time, nor before it has made its attack on the firſt order of parts. Mr. Hunter, however, had ſeen a few caſes which were exceptions to this obſervation, the malady affecting the bones before any complaints of the ſkin or throat had happened.

When the deeper-ſeated, or ſecond order of parts become affected, the progreſs of the diſeaſe is more gradual than in the firſt. The complaints produced bear a great reſemblance to ſcrofulous ſwellings, and the effects of chronic rheumatiſm, excepting, however, that the joints are leſs ſubject to be affected. At a time when there has been no poſſible means of catching the infection for many months, a ſwelling will be formed on a bone, and having given little pain, will not be taken much notice of till it is of conſiderable ſize. In other inſtances the pain may be ſevere, and yet no ſwelling occur at all, or be perceptible for ſome time afterwards. The ſame remarks are equally applicable to ſwellings of the tendons and faſciæ. As it is the character of nodes to increaſe by ſlow degrees, they are not attended with much inflammation. When they attack the perioſteum, the tumour being cloſely connected with the bone, ſeems in fact to ariſe from it.

The malady continuing to grow worſe and worſe, ſuppuration takes place in the node; but the matter which is produced is not good pus. Some nodes, both of the tendons and bones, laſt for years, before they form any matter at all. Theſe caſes, Mr. Hunter ſuſpected, might not invariably be venereal.

In caſes of nodes the pain is ſometimes very conſiderable, while at other times it is hardly ſuch as to deſerve notice. In certain inſtances, the tendinous parts, when inflamed, occaſion a heavy kind of pain; and in other examples, they will ſwell very much, and yet excite no pain worth mentioning.

The pains ariſing from a ſyphilitic affection of the bones, are uſually periodical, having exacerbations moſtly in the night. Rheumatic pains, which the venereal much reſemble, are alſo generally worſt in the night. See Hunter on Venereal Diſeaſe, p. 328, 329.

Having deſcribed the ſecondary ſymptoms of lues venerea, as occurring in the firſt and ſecond orders of parts, it remains for us to notice a few other diſeaſes frequently ſuppoſed to be ſyphilitic.

Warts, Excreſcences, &c.—Parts acquire, from the irritation of venereal matter, a diſpoſition to form excreſcences, or cutaneous tumours, called warts. Theſe are moſt prone to grow where chancres have been ſituated, which ſores, indeed, not unfrequently heal into warts. Such excreſcences are liable to be hurt by bodies rubbing againſt them, and often a ſimilar cauſe will make them exceedingly painful, and bleed very profuſely. They are conſidered, by the generality of ſurgeons, not ſimply as a conſequence of the venereal poiſon, but as poſſeſſed of its ſpecific diſpoſition, and, therefore, have recourſe to mercury for the cure of them. Mr. Hunter obſerves, however, that he never ſaw mercury have ſuch an effect, although given in ſufficient quantity to cure, in the ſame perſon, recent chancres, and ſometimes ſecondary ſymptoms. We cannot ſay that our experience is in ſupport of this laſt obſervation, though we join in the belief, that warts are never venereal. In St. Bartholomew's hoſpital, it is the common practice to give mercury for the cure, and it is done with unequivocal ſucceſs. But then the ſame excreſcences might be cured much more judiciouſly either with the knife, ligature, or eſcharotics, according to the ſhape, ſize, and ſituation of them. In all theſe ways we have ſeen a laſting cure accompliſhed, without any employment of mercury. On the whole, therefore, we think with Hunter and Dr. Adams, that ſuch complaints never partake of the ſpecific nature of the venereal diſeaſe.

With reſpect to other excreſcences, thoſe called rhagades, fici, and condylomata, were deſcribed long before lues venerea was ever heard of. The firſt are common in warm climates, particularly about the ends of the fingers, and are never venereal. "There are (ſays Dr. Adams) a number of ſoft excreſcences about the anus, to which various names have been given. They ariſe ſometimes in conſequence of a diſcharge from the rectum, ſtimulating the neighbouring parts to ulceration. If ſuch ulcers are prevented from healing by the diſcharge continuing, or by the friction of the parts, they muſt either ulcerate deeper and wider, or the cuticle will ſend out proceſſes to defend them. Theſe, on account of the preſſure they receive, grow in various ſhapes, from which they have acquired their names.

"They will ariſe from a venereal origin in two ways. If a ſecondary ulcer is ſeated in theſe parts, that ulcer having no power of healing itſelf, will take the character above deſcribed, from the nature of the parts. Sometimes, alſo, the matter of gonorrhœa, by falling from the vagina along the perineum, will produce ulceration, and the ſame conſequences follow. In either of theſe caſes, the remedy which cures the firſt diſeaſe will cure theſe local complaints; or, if they afterwards remain, they will no longer retain their ſyphilitic property, and may readily be cured by topical remedies." (On Morbid Poiſons, p. 173, edit. 2.) On this ſubject we muſt obſerve, that we have never ſeen more reaſon for conſidering ſuch excreſcences about the anus, as really ſyphilitic, than for regarding warts on the genitals in the ſame light. We ſpeak of the excreſcences alone, and not of any ulcers which may exiſt with them. Theſe tumours may always be extirpated without any bad conſequences, and mercury is unneceſſary in the cure.

Among the ſecondary ſymptoms of ſyphilis, the venereal ophthalmy might be conſidered; but as we ſhall have an article expreſsly on the various ſpecies of inflammation affecting the eye, we ſhall poſtpone this ſubject till a future opportunity. See OPHTHALMY.

General Obſervations on the Treatment of Lues Venerea.—From the remarks already delivered, the reader muſt be appriſed, that mercury is the grand remedy for all complaints unequivocally venereal. This is ſo much the caſe, that this medicine is uſually regarded as a ſpecific, and the only one to be depended upon for a cure. That mercury is powerfully efficacious in checking and curing ſyphilitic affections, is a truth as well eſtabliſhed as any in the practice of ſurgery. But whether there may not be other ſubſtances which poſſeſs anti-venereal qualities ſufficiently to be of ſervice, and even preferable to mercury, under particular circumſtances, and whether ſuch remedies alone can ever be confided in for a permanent and radical cure, are queſtions of more difficulty and uncertainty. As long as many diſeaſes preſent themſelves, having nearly the ſame appearance as ſyphilitic complaints, and as long as mercury cures not one, but a hundred diſorders, there will always be obſtacles in the way of an eaſy ſettlement of theſe conteſted points. All men muſt firſt agree, that the caſes in which the trial of any medicine is made, are decidedly venereal, or elſe the experiment will avail nothing.

If it be ſuppoſed that mercury is the only medicine to be truſted in the treatment of the venereal diſeaſe, of courſe we can have little more to do than relate the various plans of uſing this renowned remedy, and explain the principles by which its adminiſtration ought to be regulated. We mean, however, to be more impartial, and not totally ſilent reſpecting other medicines.

When lues venerea firſt invaded Europe, towards the concluſion of the fifteenth century, the conſternation which the new diſtemper excited may be more eaſily conceived than depicted. The mode in which the malady was moſt commonly communicated, the unrelenting fury with which it proceeded from one order of painful and diſguſting ſymptoms to another, and above all, the inefficacy of the ſeveral methods of treatment which were adopted by the phyſicians and ſurgeons of that period, furniſhed reaſons but too cogent for regarding it as one of the moſt deſtructive ſcourges that had ever-viſited the human race. See Pearſon on Lues Ven. Introduction.

The diſeaſe, however, had not raged long in this quarter of the world, when the efficacy of mercury in curing it was aſcertained. The Arabian phyſicians had long been in the habit of applying mercury to the purpoſes of medicine. Rhazes, the Arabian author, by whom moſt of the oriental practice was communicated to European practitioners, recommended an ointment, in which quickſilver was an ingredient, for the cure of cutaneous eruptions. It was probably, therefore, from analogy, that Vigo, Berengarius Carpus, Fallopius, and others who practiſed at the time when the venereal diſeaſe firſt made its appearance in Europe, were induced to try the effect of mercury in the form of ointments and plaſters, for the cure of cutaneous complaints proceeding from a ſyphilitic cauſe.

That the diſeaſe was unknown to Europeans before the return of Columbus from America, appears to derive material confirmation from the conſternation, deſpair, and ignorance of the diſtemper, which are confeſſed by all the moſt learned practitioners of that time. Many of them at firſt refuſed to have any thing to do with the unfortunate patients, ſome of whom were expelled from human ſociety, and compelled to ſeek refuge in the fields and woods. Fortunately, things did not long go on in this wretched manner. The analogical application of mercury was ſoon tried, and found ſtrikingly beneficial. Berengarius of Carpi, who was the firſt that tried the effects of mercury in the cure of ſyphilis, ſoon made an ample fortune by the practice of the ſecret, according to the report of Fallopius. Berengarius and Vigo were almoſt the only practitioners who were acquainted with the important diſcovery of mercury being a cure for the new and dreadful diſtemper, and it was from their ſucceſs, and the candid repreſentations of Vigo and Fallopius, that mercury became the accepted and eſtabliſhed antidote for the venereal diſeaſe. The old practitioners employed mercury in the form adviſed by Rhazes; they uſed it as an ointment, and, without knowing that the mineral was taken into the conſtitution by means of the abſorbents, they continued the practice entirely from the beneficial conſequences demonſtrated to them by experience. When patients were afflicted with pains in the bones, the plan of applying mercurial plaſters to the parts affected ſoon became a cuſtom. The phyſicians and ſurgeons, at the time when mercury firſt began to be uſed for the cure of the lues venerea, were not acquainted with many chemical preparations of that mineral, and indeed, as it was regarded as a poiſon when internally taken, external ointments and plaſters were alone deemed juſtifiable. The hydrargyrus nitratus ruber, however, was known to John de Vigo, who has recommended it as an application to chancrous ulcers. The internal exhibition of mercury was at firſt generally condemned; and ſo fearful were practitioners of the effects of this mineral, that even its external employment was conducted with the moſt extreme caution. In fact, the ointment which was at firſt uſed only had in its compoſition one-fortieth part of quickſilver; the proportion was afterwards increaſed to one-fourteenth, and laſtly, to one-eighth. Beſides ointments and plaſters, fumigations were ſoon introduced into practice; for as it was ſuppoſed that mercury produced a cure altogether by coming into contact with the part affected, it was judged neceſſary to contrive ſome mode of introducing mercury to ſores in the throat, and for that purpoſe fumigations were adopted.

At length the chemiſts ſet themſelves to work in making numerous mercurial preparations, to ſome of which ſuperior efficacy was imputed. It was as early as the year 1553 that lotions of ſublimated mercury were firſt employed by Angerius Ferrerius. Two ounces of it were diſſolved in ſix pounds of diſtilled water. With this mixture the whole body was waſhed and rubbed, excepting the head, breaſt, ſtomach, and arm-pits; and this method was continued once, twice, or thrice a day for ten days, according to the ſtrength of the patient, and other circumſtances. The patient was at the ſame time ſweated moſt profuſely; for ſweating was conceived to aſſiſt in the cure, becauſe the diſtemper was more eaſily overcome in the Weſt Indies, where diaphoretic means had long been uſed in aid of guaiacum. Quickſilver girdles for the loins and wriſts were alſo in faſhion. The fumigations were made with mercury extinguiſhed in turpentine, or elſe with cinnabar blended with inflammable ingredients.

John de Vigo was the firſt who avowed giving mercury internally, about the year 1535. The medicine that he exhibited in this manner was the hydrargyrus nitratus ruber, which had been previouſly praiſed both by Vigo himſelf and Nicholas Maſſa, as a moſt beneficial application to venereal ulcers. The violent effects of this preparation, when adminiſtered internally, ſoon brought it into diſrepute, and then pills of crude mercury came into uſe.

If, however, the firſt employment was generally conducted with extreme caution and timidity, there were many exceptions, and afterwards, when the profeſſion became more familiar with the method, they became of courſe bolder. For we learn that, after a time, the flagrant evils ariſing out of the improvident uſe of the medicine, and the frequent inſtances of death from its poiſonous action, excited an univerſal clamour againſt it, and many preferred enduring the diſeaſe to the mercurial remedy. It is no wonder, therefore, that guaiacum, when brought into Europe in 1517, China-root in 1535, ſarſaparilla about the ſame time, and ſaſſafras a little afterwards, were received with wonderful applauſe, as delivering the afflicted from a dreaded diſtemper, and a more dreaded remedy. (See Foot on Lues Ven. lect. 19.) What degree of merit ſuch medicines poſſeſs, we ſhall preſently enquire.

As ſoon as it was aſcertained that pharmaceutical preparations of mercury might be internally given, without the degree of danger formerly apprehended, myriads of ſecret formulæ began to be obtruded upon every town and every country of Europe. Among the moſt famous remedies were the mercurius dulcis; the common Æthiops; mercurius alkalizatus ground with oyſter-ſhells; mercurius antithiſicus with dry balſam of Peru; mercurius antiſcorbuticus with gum guaiacum; mercurius dulcis with manna; mercurius diureticus with juniper gum; and mercurius catharticus with ſcammony. Afterwards rougher preparations were made uſe of, ſuch as mercurius precipitatus albus; a ſolution of red precipitate in aquafortis corrected, red precipitate, turbith mineral, green precipitate, beſides numerous high ſounding panaceæ. Even a ſolution of corroſive ſublimate, mixed with barley-water, or water-gruel, was long ago execrated as "the vile practice of London quacks" by our countryman Wiſeman.

With ſuch a farrago of mercurial preparations it is hardly to be expected that any regular and rational plan of treatment could be purſued by the generality of the old practitioners.

tioners. The common methods were chiefly empirical, and it was not until towards the beginning of the eighteenth century, that the treatment of the venereal diſeaſe began to be regulated by ſcientific principles.

In the elegant edition of Aphrodiſiacus by Boerhaave, a full account may be ſeen of circumſtances confirming the preceding ſtatement.

Whoever will conſult Wiſeman, one of the moſt reſpectable authors we have in ſurgery, will find that the ſymptoms of the venereal diſeaſe were in general much more ſevere in his time than they are at preſent, and at the ſame time that the mode of practice was ſtill much ſeverer. In claps, large and repeated doſes of draſtic purges, calomel, and turpeth mineral were the medicines employed, even in the inflammatory ſtate of the diſeaſe, and ſome turpentine remedies were given to complete the cure. Venereal ſores were powdered with red precipitate, and dreſſed with the moſt acrid and ſtimulating applications. In confirmed ſyphilis, the hot ſalivating method of treatment was adopted; the patient was crammed into a ſmall room heated with a ſtove; the admittance of freſh air was prevented by blankets put up at the door and windows; and the patient himſelf was ſurrounded with a ſcreen. There he ſat, half ſuffocated in his own hot putrid atmoſphere, and was rubbed with mercurial ointment, until his tongue generally lolled out, and the inſide of his mouth was covered with ſloughs. In this hideous pickle it was cuſtomary for him to lie from twenty-five to thirty days.

It is no wonder, as Mr. Deaſe has obſerved, that many fell victims to this prepoſterous mode of treatment, few conſtitutions being able to endure it, and no conſtitution eſcaping without material and permanent injury.

Our Engliſh Hippocrates, the great Sydenham, lays it down as an axiom, that, as the venereal virus is of a very inflammatory nature, the principal end to be aimed at in the treatment ought to be evacuation. In gonorrhœa he adviſes ſtrong draſtic purges, which are to be perſiſted in for a long time. The firſt fourteen days of the diſeaſe he purges the patient every day; then every ſecond day; and, towards the latter end of the caſe, twice a week. Should the cure advance but ſlowly, eight grains of turpeth mineral, given twice or thrice, at due intervals, Sydenham reckons extremely effectual. Where purgatives are rejected by the mouth, he ſubſtitutes clyſters. Balſam of Mecca, or Cyprus turpentine cloſes the cure. He thinks injections do much more miſchief than ſervice; and is averſe, in theſe caſes, to the uſe of mineral waters, and decoctions of the woods.

As Sydenham does not account mercury a ſpecific, in the cure of lues venerea, only inaſmuch as it is poſſeſſed of a ſuperior efficacy in exciting ſalivation, he conſiders as uſeleſs and hurtful all preparation, as bleeding, purging, or bathing, before putting the patient into a ſalivation. He thought that the leſs the patient was weakened, the greater was the probability of a cure. His whole attention, in the treatment, is to keep up a high degree of ſalivation. If the rubbing does not have this effect, he gives turpeth mineral, or calomel; and, of the latter medicine, he gives a doſe once a week, for ſome months after the cure is apparently effected, for fear of a relapſe. He is againſt carrying off, by purging, any remains of the ſpitting after the courſe is over; and, during the whole treatment, allows the patient ſuch light meats as may be deſired.

The methods of treating lues venerea, as laid down by Wiſeman and Sydenham, were for a long time followed, throughout Europe, with no material variation. At length the celebrated Aſtruc gave one of the moſt elaborate treatiſes on this diſtemper ever publiſhed.

The treatment of a gonorrhœa he conſiders at three different periods. In the firſt, or inflammatory ſtage, he directs us to employ large and repeated bleedings; and thinks, that the indication for copious bleeding is as ſtrongly pointed out in this caſe, as in that of a peripneumony, or dyſentery. He orders large quantities of cooling emulſions to be frequently drunk, the bowels to be kept open with emollient glyſters, opiates, if the ſymptoms are violent, cooling injections, fomentations, poultices to the penis and perineum, and a very ſlender regimen. In the ſecond ſtage, when the inflammatory ſymptoms have ſubſided, after purging two or three times with jalap, diagredium, or calomel, he has recourſe to mercurial frictions every ſecond day, to be more immediately employed about the parts of generation and perineum. He continues the ſame ſevere regimen. In the third ſtage, he completes the cure by ſome of the turpentines, mineral, acidulated, vitriolic, or ſteel waters, or the common aſtringents. He reprobates aſtringent injections. In what he terms the dry gonorrhœa, he puſhes the antiphlogiſtic treatment much farther; for he even bleeds every fourth hour.

In the cure of ſyphilis, Aſtruc prefers ſalivation by mercurial frictions. He enters into a long deſcription of the neceſſary previous preparation; bleeding, purging, warm bathing, medicated broths, and ſlender regimen. He ſays, it is ſeldom we can diſpenſe with leſs than ten baths; more generally, he orders twenty. After this courſe of bathing, the bleeding and purging muſt be repeated. He then has recourſe to the mercurial frictions, which he ſo directs as to keep up unremittingly a full regular ſpitting, from two to three pints in twenty-four hours, until the cure is completed. The patient is then cleanſed in a warm bath, and purged.

Not long after Aſtruc's work made its appearance, practitioners became extremely divided in opinion as to the method of adminiſtering the mercurial frictions, for the cure of lues venerea. Some of the moſt reſpectable followed the plan laid down by Aſtruc; while the greater number of practitioners in France followed the Montpelier method of extinction; that is, after having firſt made the patient take twenty or thirty warm baths, and kept him for ſome time on a very ſlender regimen, the frictions were ſo adminiſtered as not to raiſe any ſpitting, and thus continued for three or four months, until the venereal virus was totally eradicated.

The celebrated Van Swieten, in the fifth volume of his Commentaries on Boerhaave's Aphoriſms, adopts, in a great meaſure, the opinion of his illuſtrious maſter in treating of this diſeaſe. In the treatment of gonorrhœa, if we except his diſapprobation of bleeding, which he thinks is very ſeldom neceſſary, we find nothing new: for he follows the general mode of practice, and effects a cure chiefly by purgatives.

In the treatment of ſtrictly venereal caſes, he gives a preference to ſalivation raiſed by internal mercurials, inſtead of employing the unction. He thinks that the quantity of mercury, introduced into the ſyſtem, is much better aſcertained, when mercurius dulcis three times ſublimed, or white precipitate, is made uſe of, in lieu of frictions with mercurial ointment. He conſiders that the quantity of mercury, introduced in this latter method, muſt be uncertain; and that as it does not paſs out of the ſyſtem as readily as ſaline mercurials, it may accumulate, and be depoſited in dangerous quantities, in different parts of the body, and be productive of the worſt conſequences. But, above all other methods of curing the diſeaſe, Van Swieten prefers the well known ſolution of corroſive ſublimate in brandy, or ſpirits. By this medicine, which was in general uſe in St. Mark's hoſpital, Vienna, four thouſand eight hundred and eighty perſons are ſaid to have been perfectly cured of the venereal diſeaſe, in the courſe of eight years, without undergoing any tedious preparation, or having any dangerous ſymptom intervene.

The ingenious author of the Parallel of the different Methods of treating the Venereal Diſeaſe (ſuppoſed to have been the phyſician Petit) is extremely ſevere in cenſuring this method of treatment, and aſſerts that, from repeated experience, he has found the adminiſtration of the ſolution to be very precarious, and by no means productive of the good effects ſo laviſhly promiſed by the Vienna practitioners. See Obſ. on the different Methods of treating the Venereal Diſeaſe, by W. Deaſe, 1779, the Introduction.

From theſe obſervations on the mercurial remedies employed, and plans adopted, by the old ſurgeons, in the treatment of ſyphilitic affections, let us paſs on to the conſideration of the practice of modern times, which has been vaſtly influenced by the doctrines promulgated by Mr. Hunter. The leading points of his theory having been already ſtated in the foregoing columns, we ſhall not repeat them at large in this place. Suffice it to ſay, that this ſurgeon inculcated, that when the venereal poiſon was abſorbed, it contaminated the ſyſtem at once, leaving only a diſpoſition behind it, which is brought forth into action in various parts at various times; that the local cauſe of this diſpoſition, and its effects, may be cured by mercury, but that the diſpoſition itſelf cannot; and that parts, once cured, cannot be contaminated again from the ſame ſtock of infection.

It muſt not be diſſembled, that the theories of Mr. Hunter, reſpecting lues venerea, are in ſome reſpects obſcure and queſtionable. Much difficulty has been experienced in rightly comprehending his exact meaning; and he has even been accuſed of inconſiſtency and contradiction. Dr. Adams, in his Commentary on Hunter's Treatiſe, has publiſhed the ſubſtance of a converſation, which he once had with this famous character, with regard to the difficulty attending the comprehenſion of the doctrines in queſtion. On this occaſion, Mr. Hunter related the following caſe, to ſhew how eaſily his opinions might be underſtood, even by a perſon altogether unaccuſtomed to ſuch inquiries.

"A gentleman," ſaid Mr. Hunter, "who had been cured of a chancre at a diſtance from home, called to conſult me whether he might conſider himſelf as perfectly free from the diſeaſe. Whilſt he was taking great pains to explain to me how he had been ſalivated, and how long he had continued the uſe of mercury, after the chancre was healed, I interrupted him by obſerving, that if he had continued the uſe of mercury till now, I could not pretend to ſay whether he was free from the diſeaſe.—How then, ſaid the gentleman, am I to aſcertain my real ſituation?—If, replied I, you find no ſymptoms in the courſe of three months, the probability is that you will remain well, till you expoſe yourſelf to a new ſource of infection.

"In about ſix weeks he returned, with a ſore throat and copper ſpots. I explained to him, that he ſhould not blame his ſurgeon, who, even if he had known what was to happen, could not have prevented it. The patient went through a very neceſſary courſe of mercury, till he was cured of every ſymptom, and then demanded, with ſome impatience, whether he was then ſecure.—You are ſecure, replied I, from every return on your genitals, and on your ſkin and throat; but as it is impoſſible for me to know whether your bones are contaminated, I cannot pretend to ſay whether you will have nodes in a few weeks' time. He now began to comprehend the doctrine, and ſubmitted to await the reſult. In about ſix weeks he actually had nodes; after the cure of which, by a ſevere ſalivation, I made no ſcruple to aſſure him that he was perfectly free from the diſeaſe."

According to Mr. Hunter's principles, then, if mercury were exhibited for ten years, it could not prevent the diſpoſition, after it is once formed, from proceeding to action ſome time or another; and although this author admits that this remedy may altogether hinder the diſpoſition from taking place at all, yet that it has no power of eradicating any forms of the diſeaſe, except what is poſitively in action, and conſequently more or leſs palpable. As it was likewiſe a poſition in Mr. Hunter's theory, that the parts contaminated, or thoſe to which the diſpoſition was imparted, became thus infected all about the ſame time, and very ſoon after the firſt abſorption of the virus into the conſtitution, the inference neceſſarily followed, that mercury could ſeldom avail in hindering the formation of the diſpoſition, except in an early ſtage of the caſe. According to the Hunterian opinions, mercury given as a *preventive*, on any other principle, was entirely uſeleſs. The parts contracted the diſpoſition ſoon after the virus had been abſorbed into the ſyſtem, unleſs, by good luck, mercury had been employed ſo early and efficiently as entirely to prevent ſuch diſpoſition from taking place. If it had not been uſed early enough, and with ſufficient effect to prevent the formation of the diſpoſition in the parts ſuſceptible of contamination, theſe could not fail of falling afterwards, but at an uncertain period, into a palpable ſtate of ſyphilitic action, and in that ſtate alone were capable of being cured by mercury. The diſpoſition, though it might have been prevented, could not be cured by mercury. That part of the doctrine, alſo, which inculcates that parts, which have been once cured, cannot be contaminated again from the ſame ſtock of infection, tends ſtrongly to ſhorten a mercurial courſe; becauſe, as the foregoing caſe illuſtrates, when one order of parts have been cured by mercury, there is no danger of a recurrence of the diſtemper in them: and though the diſpoſition may exiſt in another order of parts, and, of courſe, muſt come into action, it would be abſurd to continue mercury on that account, both becauſe this mineral abſolutely has not the power of deſtroying the diſpoſition, and it can never be known, *à priori*, whether theſe other parts are contaminated or not.

The employment of the term *diſpoſition* has led to much diſputation. Many have not been able to underſtand the word, and others have raiſed ſeveral objections to it. The critical examiners of Mr. Hunter's doctrine aſk, how is it poſſible to prove that a venereal diſpoſition has, or has not, exiſted at any particular time? If, after a certain courſe of mercury, and the conſequent removal of a chancre, blotches ſhould appear, then, ſays Mr. Hunter, a diſpoſition had been formed, which no quantity of mercury could have deſtroyed. But, obſerve the critics, may we not, with at leaſt equal probability ſay, that in ſuch caſes mercury had been inſufficiently uſed? If, on the other hand, after ſuch a courſe, no blotches ſhould occur, the friends of the doctrine tell us, the ſecondary order of parts had not been contaminated; but, in this caſe, it may be contended by the oppoſite party, that the mercurial courſe had been judicious and efficient. It is inſiſted by Mr. Hunter's opponents, that the exiſtence of this incurable diſpoſition cannot be proved; nor by his friends can it be juſtly and conſiſtently aſſumed; for if it be action, then its coincidence with other actions is admitted contrary to their principles; if it be not action, then the diſeaſe which follows is motion without impulſe, and effect without a cauſe. This opinion, indeed, with regard to the difference of diſpoſition and action, it is maintained, was not ſteadily and uniformly contemplated by Mr. Hunter himſelf in his practice, or even in his theories; for he ſometimes talks of the cure of lues venerea in the ſtate of diſpoſition, and generally continued the exhibition of mercury, after the diſappearance of the ſymptoms. (See London Medical Review, No. 11, p. 248, 249.) For our own part, without undertaking to defend the inconſiſtencies into which Mr. Hunter has undoubtedly fallen, we have no heſitation in declaring our belief, that his opinions and doctrines in general concerning lues venerea, and the power of mercury over it, are the beſt and moſt rational that have ever been promulgated. In particular, we cannot concur with the anonymous critic quoted above, when he thinks it as reaſonable to refer the perfection, or imperfection of the cure, to mercury having been ſufficiently, or inſufficiently uſed. We have known inſtances in which patients have been almoſt conſtautly employing mercury for twelve and eighteen months for the cure of local complaints, ſucceeded by ſore throats and eruptions, and yet, after all this time, and after all this perſeverance in the uſe of mercury, nodes on the cranium, ſkin, or ulna, have ariſen. Certainly, when a patient has been for many months in a ſtate of ſalivation, and has thereby got rid of all his palpable ſymptoms, we are not juſtified in concluding that becauſe future complaints begin, theſe might have been hindered by a further continuance of the mercurial courſe. Mercury is ſo often uſed in immoderate quantities, and for ſo unreaſonable a length of time, without preventing a ſucceſſion of ſecondary ſymptoms, that we cannot bring our minds to believe, that the recurrence of the diſeaſe, in ſuch caſes, can be hindered by any judicious or practicable perſeverance in the employment of this mineral. At the ſame time we are not ſuch bigots to the Hunterian theory as to ſuppoſe, that the uſe of mercury ought not to be continued an inſtant after a chancre, or bubo, is either healed or apparently converted into a common ſore. It is generally impoſſible to aſcertain, with preciſion, the exact moment when venereal action ceaſes. The diſpoſition, or contamination of other parts, may poſſibly ſometimes happen later than Mr. Hunter ſuppoſed, and we have every reaſon to conclude that ſuch diſpoſition may be imparted at any time, while the venereal action in a chancre, or bubo, is not completely ſubverted. Mr. Hunter ſuppoſed, that the ſyphilitic poiſon could only be abſorbed when blended with pus. Perhaps the virus may exiſt, and be taken up by the abſorbents in other forms. The induration left after a chancre is healed is not always free from the venereal action, though not a drop of matter is now ſecreted; yet as there are ſo many inexplicable circumſtances in certain caſes of the preſent diſeaſe, it ſeems almoſt warrantable to believe that the virus may exiſt, and be imbibed by the abſorbents, ſo as to impart the diſpoſition to the diſtemper at later periods than Mr. Hunter conjectured, and under an additional number of ſtates and circumſtances. According to Mr. Hunter, the matter of ſecondary ulcers is not poſſeſſed of the ſpecific venereal quality, and cannot produce the diſeaſe, when abſorbed, as the matter of a chancre or bubo does. Suppoſing this to be true, whatever opinions may be entertained reſpecting the continuance of mercury, after the venereal action of a chancre or bubo has apparently ceaſed, there can be no diverſity of ſentiment in regard to the inutility of perſevering in that medicine, after ſecondary ſores are either healed or have had their character entirely altered.

Having detailed the ancient practice, mentioned the forms in which mercury was formerly exhibited, and endeavoured to give ſome idea of the degree of power which this medicine poſſeſſes over ſyphilitic affections, it is our place to make a few obſervations on the mercurial preparations, to which modern practitioners generally give the preference.

As long ago as the days of Berenger of Carpi, who, as we have recited, was the firſt perſon that aſcertained the efficacy of mercury in the treatment of ſyphilis, it has been well known that this metal, in its reguline ſtate, poſſeſſes no medicinal virtue. Its power of acting againſt diſeaſe only exiſts when it is in the ſtate of a ſalt, or oxyd. Its preparations have alſo very different degrees of efficacy.

The moſt active of all the preparations of mercury is the oxygenated muriate, the oxymurias, or, as it is generally called, the corroſive ſublimate, which is, in fact, a violent poiſon. We have already ſtated, that the celebrated Van Swieten was exceedingly partial to this medicine in ſyphilitic caſes. He diſſolved it in brandy, or alcohol, and diluting this mixture with a certain proportion of water, preſcribed the remedy in a fluid ſtate. The ordinary doſe is a quarter of a grain every day; but the quantity may, in particular inſtances, be increaſed to half or three quarters of a grain every 24 hours. Sublimate is, even at the preſent time, uſually preſcribed after the manner directed by Van Swieten, the ſolution in alcohol being ordinarily taken, either in ſome warm milk, a decoction of ſarſaparilla, or blended with ſome ſyrup, which vehicles are ſuppoſed to prevent the ſublimate from diſordering the ſtomach and bowels. Notwithſtanding theſe correctives, this preparation of mercury often produces conſiderable ſickneſs and griping pains, and it is reckoned extremely improper for patients labouring under pulmonary affections. It ſhould only be tried in caſes where the conſtitution is ſtrong and free from much irritability. But the moſt important truth to be attended to is the deciſion of many experienced ſurgeons, that the corroſive ſublimate, though a powerful medicine, has not ſo much efficacy in accompliſhing a radical cure of ſyphilitic diſeaſes, as ſeveral other more ſimple and mild preparations of mercury. Hence it is ſeldom exhibited by ſurgeons of the preſent time for the cure of primary venereal ſymptoms, except when particular circumſtances are in the way of other more approved methods. The convenience and ſecrecy with which a ſolution of the corroſive ſublimate may be taken, and the circumſtance of a ſmall phial of it being in ſome inſtances ſufficient for the cure, may, perhaps, be reaſons why it has been more extenſively adminiſtered, than its comparative efficacy appears to juſtify.

The ſubmurias hydrargyri, or calomel, is far leſs active than the oxymurias, or corroſive ſublimate, and though not now very much employed in this country for the cure of unequivocal ſyphilitic complaints, it is, like every other preparation of mercury, anti-venereal, and was at one time commonly given. Whenever it is exhibited at preſent, it is almoſt always in the form of pills, containing from one to three grains. When the doſe is larger, purging is generally excited, and little ſpecific effect on the diſeaſe is the conſequence. Hence, when calomel is preſcribed with a view of producing a ſalivation, opium muſt generally be conjoined with it. Calomel has alſo been mixed with ointment, ſo as to form a dreſſing for venereal ſores, or admit of being introduced into the ſyſtem by being rubbed upon the ſkin. Attempts have likewiſe been made to cure ſyphilis by frictions with calomel on the gums, and inſide of the lips and cheeks. However, violent and dangerous ptyaliſms having, in this manner, been ſometimes produced, without the diſeaſe being radically cured, the method has fallen into diſrepute. In the article FUMIGATION, we have deſcribed a powder, made with calomel, for the purpoſe of being applied to the ſurface of the body in the form of a vapour, or a ſubtile powder raiſed by heat.

Sometimes, when patients cannot rub in mercurial ointment, or frictions alone have not ſufficient effect, a grain of the hydrargyrus calcinatus, now called hydrargyri oxydum rubrum, is preſcribed, and to prevent bad effects on the bowels, half a grain of opium is generally directed to be taken at the ſame time. The grey oxyd of mercury, formed by the trituration of quickſilver with fat, is the moſt common, ſafe, and effectual preparation for the cure of ſyphilitic complaints. A piece of this ointment, about as large as a nutmeg, is ordinarily rubbed into the ſurface of the body, for about half an hour before the fire. When there is a bubo in the groin, the leg and thigh, on the affected ſide, are generally preferred for the frictions; but when this is inconvenient, the ointment may be rubbed upon any other part of the body. Mercurial ointment, provided the fat is not rancid, which it is very apt to be, makes an eligible application to both primary and ſecondary venereal ulcers, when it is ſpread upon lint. The introduction of mercury into the conſtitution, by frictions with ointment, is one of the oldeſt and beſt methods. When the patient cannot rub in himſelf, the buſineſs may be done by an attendant, who muſt be provided with gloves, made of oil-ſkin, or pig's bladder, leſt he ſalivate himſelf. The frictions are ſaid to have the moſt effect when made along the inſide of the limbs, where anatomy ſhews that the largeſt lymphatics are ſituated. It is always a prudent maxim to begin a courſe of mercury in a very gentle way, only ſmall quantities of the ointment being at firſt ventured upon. Perhaps half a dram is enough to begin with. Nor need the frictions be made every day until the ability of the conſtitution to bear the medicine has been tried. Thus, the patient may commence with rubbing half a dram of the ointment on the inſide of the leg. After letting one day intervene, he may make the ſecond friction on the inſide of the thigh. When another intervening day has elapſed, the third application of the ointment may be made to the hip and lower part of the abdomen. The fourth friction may be made on the arms, unleſs the patient ſhould prefer beginning again on the leg. During ſuch employment of the ointment, the patient, if convenient, ſhould waſh himſelf now and then in a warm bath, and have coſtiveneſs obviated by mild purgatives. The preceding method is generally commendable, becauſe it removes all chance of too ſudden and violent a ſalivation, as well as diminiſhes the peril, with which the adminiſtration of mercury is liable to be accompanied in particular conſtitutions. Though ſuch is the moſt prudent plan to be followed in the generality of caſes, it muſt ſtill be remembered, that there are certain inſtances in which the affection of the ſyſtem with mercury ought to be expedited, for the purpoſe of preventing the ſerious conſequences, which might ariſe from the ſpreading of venereal ulceration in particular ſituations, as where a chancre threatens to deſtroy the whole glans, or an ulcer in the throat to eat away all the velum pendulum palati. In every caſe it is highly proper, that the patient ſhould have ſome tenderneſs of the gums, and a copper taſte in his mouth, as teſts of his conſtitution being under the influence of mercury; but all violent ſalivations, attended with extreme ſoreneſs and ſloughing of the mouth, and vaſt ſwelling of the face, are condemned as unneceſſary, and in every reſpect blameable, by all the moſt judicious practitioners of the preſent time.

The grey oxyd of mercury, made by triturating quickſilver with ſugar or honey, compoſes the common pil. hydrarg. or blue pill, which, in ordinary caſes, is the beſt mercurial medicine for internal uſe. It is given, either to aſſiſt the action of the ointment, or when the frictions cannot be executed. The common doſe is ten grains every night, opium being added when any griping or purging is excited.

Such are the preparations of mercury ordinarily uſed by Britiſh ſurgeons in the treatment of ſyphilis.

In addition to the foregoing directions, reſpecting the management of a mercurial courſe, there are many other circumſtances to be obſerved. Every ſurgeon ſhould be impreſſed with the importance of the patient keeping himſelf warm, and avoiding all expoſure to damp and cold, during the employment of mercury. He ſhould be recommended to keep to his room, and wear worſted ſtockings, and flannel drawers and waiſtcoat. Experience has proved, that expoſure to the damp cold air ſometimes determines the action of mercury violently either to the mouth, or the bowels, and materially leſſens its effect upon the diſeaſe.

According to Mr. Hunter, when a courſe of mercury is about to be undertaken, we are to conſider two things; firſt, the preparation and mode attended with the leaſt trouble or inconvenience to the patient; and ſecondly, the preparation and mode of adminiſtering it, that moſt readily conveys the neceſſary quantity into the conſtitution. Mercury is carried into the conſtitution in the ſame way as other ſubſtances, either by being abſorbed from the ſurface of the body, or that of the alimentary canal. It cannot, however, in all caſes be taken into the conſtitution in both ways; for ſometimes the abſorbents of the ſkin will not readily receive it, at leaſt no effect is produced, either on the diſeaſe, or conſtitution, from this mode of application. In this circumſtance, mercury muſt be given by the mouth, although the plan may be very improper in other reſpects, and often inconvenient. On the other hand, the internal abſorbents ſometimes will not take up the medicine, or at leaſt no effect is produced on the diſeaſe, or the conſtitution.

In ſuch caſes, all the different preparations of the medicine ſhould be tried; for ſometimes one ſucceeds when another will not. In ſome caſes, mercury ſeems to have no effect, either applied outwardly, or taken into the ſtomach. Many ſurfaces ſeem to abſorb mercury better than others; ſuch are probably all internal ſurfaces and ſores. Thirty grains of calomel, rubbed in on the ſkin, have not more effect than three or four taken by the mouth. Dreſſing ſmall ulcers with red precipitate ſometimes cauſes a ſalivation. Hunter on the Venereal Diſeaſe, p. 335, 336.

Beſides the practicableneſs of getting the medicine into the conſtitution in either way, it is proper to conſider the eaſieſt for the patient, each mode having its convenience and inconvenience, depending on the nature of the parts to which it is applied, or on certain ſituations of life at the time. Hence, it ſhould be given in the way moſt ſuitable to ſuch circumſtances.

In many, the bowels can hardly bear mercury at all, and it ſhould then be given in the mildeſt form poſſible, conjoined with ſuch medicines as will leſſen, or correct its violent local effects, although not its ſpecific ones on the conſtitution.

When mercury can be thrown into the conſtitution with propriety by the external method, it is preferable to the internal plan, becauſe the ſkin is not nearly ſo eſſential to life as the ſtomach, and, therefore, is capable in itſelf of bearing much more than the ſtomach. The conſtitution is alſo leſs injured. Many courſes of mercury would kill the patient, if the medicine were only given internally, becauſe it proves hurtful to the ſtomach and inteſtines, when given in any form, or joined with the greateſt correctors. Every one, however, has not opportunities of rubbing in mercury, and is therefore obliged, if poſſible, to take it by the mouth. Hunter, p. 338.

Mercury has two effects, one as a ſtimulus on the conſtitution and particular parts; the other as a ſpecific on a diſeaſed action of the whole body, or of parts. The latter action can only be computed by the diſeaſe diſappearing.

In giving mercury in the venereal diſeaſe, the firſt attention ſhould be to the quantity, and its viſible effects in a given time, which, when brought to a proper pitch, are only to be kept up, and the decline of the diſeaſe to be watched; for by this we judge of the inviſible, or ſpecific effects of the medicine, and know what variation in the quantity may be neceſſary. The viſible effects of mercury affect either the whole conſtitution, or ſome parts capable of ſecretion. In the firſt, it produces univerſal irritability, making it more ſuſceptible of all impreſſions. It quickens the pulſe, increaſes its hardneſs, and occaſions a kind of temporary fever. In ſome conſtitutions it operates like a poiſon. In ſome it produces a kind of hectic fever, that is, a ſmall quick pulſe, loſs of appetite, reſtleſſneſs, want of ſleep, and a ſallow complexion, with a number of conſequent ſymptoms; but ſuch effects commonly diminiſh on the patient becoming a little accuſtomed to the medicine. Mercury often produces pains like thoſe of rheumatiſm, and nodes of a ſcrofulous nature. Hunter, p. 339, 340.

The quantity of mercury to be thrown into the conſtitution, for the cure of any venereal complaint, muſt be proportioned to the violence of the diſeaſe. However, we are to be guided by two circumſtances, namely, the time in which any given quantity is to be thrown in, and the effects it has on ſome parts of the body, as the ſalivary glands, ſkin, or inteſtines. For mercury may be thrown into the ſame conſtitution in very different quantities, ſo as to produce the ſame ultimate effect; but the two very different quantities muſt alſo be in different times; for inſtance, one ounce of mercurial ointment, uſed in two days, will have more effect upon the conſtitution, than two ounces uſed in ten. The effects of one ounce, uſed in two days, on the conſtitution and diſeaſed parts, are conſiderable. A ſmall quantity, uſed quickly, will have equal effects, to thoſe of a large one employed ſlowly; but if theſe effects are principally local, that is, upon the glands of the mouth, the conſtitution at large not being equally ſtimulated, the effect upon the diſeaſed parts muſt be leſs, which may be known by the local diſeaſe not giving way in proportion to the effects of mercury on ſome particular part. If it is given in very ſmall quantities, and increaſed gradually, ſo as to ſteal inſenſibly on the conſtitution, a vaſt quantity at a time may at length be thrown in, without any viſible effect at all. Hunter, p. 341.

Theſe circumſtances being known, mercury becomes a much more efficacious, manageable, and ſafe medicine, than it was formerly thought to be; but, unluckily, its viſible effects upon the mouth and the inteſtines are ſometimes much more violent, than its general effect upon the conſtitution at large. Theſe parts muſt therefore not be ſtimulated ſo quickly, as to hinder the neceſſary quantity of mercury from being uſed.

The conſtitution, or parts, are more ſuſceptible of mercury at firſt than afterwards. If the mouth is made ſore, and allowed to recover, a much greater quantity may be thrown in, a ſecond time, before the ſame ſoreneſs is produced. However, anomalous caſes occur, in which, from unknown cauſes, mercury cannot at one time be made to produce any viſible effects; but afterwards, the mouth and inteſtines are all at once affected. Hunter, p. 342.

Mercury occaſionally attacks the bowels, and cauſes violent purging, even of blood. This effect is remedied by intermitting the uſe of the medicine, and exhibiting opium. At other times, it is ſuddenly determined to the mouth, and produces inflammation, ulceration, and an exceſſive flow of ſaliva. To obtain relief in this circumſtance, purgatives, nitre, ſulphur, gum-arabic, lime-water, camphor, bark, kali ſulphuratum, bliſters, &c. have been adviſed. Mr. Pearſon, however, does not ſeem to place much confidence in the efficacy of ſuch means, and the mercury being diſcontinued for a time, he recommends the patient to be freely expoſed to a dry cold air, with the occaſional uſe of cathartics, Peruvian bark, and mineral acids, and the aſſiduous application of aſtringent gargles. "The moſt material objection, (ſays Mr. Pearſon,) which I foreſee againſt the method of treatment I have recommended, is the hazard, to which the patient will be expoſed, of having the ſaliva ſuddenly checked, and of ſuffering ſome other diſeaſe in conſequence of it.

"That the haſty ſuppreſſion of a ptyaliſm may be followed by ſerious inconveniences, has been proved by Dr. Sylveſter, (Med. Obſ. and Inq. vol. iii.) who publiſhed three caſes of perſons who had been under his own care; two of whom were afflicted with violent pains; and the third ſcarcely retained any food in her ſtomach for the ſpace of three months. I have ſeen not only pains, but even general convulſions, produced from the ſame cauſe. But this ſingular kind of metaſtaſis of the mercurial irritation does not appear to me to owe its appearance to ſimple expoſure to cold and dry air; becauſe I have known it occur in different forms, where patients continued to breathe a warm atmoſphere, but uſed a bath, the water of which was not ſufficiently heated. Cold liquids, taken in large quantity into the ſtomach, or expoſure of the body to cold and moiſture, will alſo prove extremely injurious to thoſe who are fully under the influence of mercury; whereas breathing a cool air, while the body is properly covered with apparel, has certainly no tendency to produce any diſtreſſing or dangerous conſequences.

"If, however, a ſuppreſſion of the ptyaliſm ſhould be occaſioned by any act of indiſcretion, the remedy is eaſy and certain; it conſiſts only in the quick introduction of mercury into the body, ſo as to produce a ſoreneſs of the gums, with the occaſional uſe of a hot bath." Pearſon on the Effect of Various Articles in the Cure of Lues Venerea, edit. 2. p. 163, 164.

Mercury, when it falls on the mouth, produces, in many conſtitutions, violent inflammation, which ſometimes terminates in mortification. In theſe habits great caution is neceſſary. The ordinary operation of mercury does not permanently injure the conſtitution; but, occaſionally, the impairment is very material; mercury may even produce local diſeaſes, and retard the cure of chancres, buboes, and certain effects of the lues venerea, after the poiſon has been deſtroyed. Hunter, p. 342.

When an immoderate and violent ſalivation is ſuddenly produced, the means in repute for leſſening this accident are, bathing the feet in warm water, clyſters, cathartics, and bliſters. The application of pounded ice to the jaw, and waſhing the mouth and throat with cold acidulated gargles, are, perhaps, meaſures as ſerviceable as any that can be adopted.

In the article ERETHISMUS, we have deſcribed a dangerous ſtate of the ſyſtem, ſometimes occaſioned by the uſe of mercury, and producing death in the moſt ſudden and unexpected manner. This is a ſubject urgently requiring the attention of the practitioner; but as we have treated of it elſewhere, we ſhall here be content with referring to the above-mentioned part of the preſent publication.

Mercury occaſionally gives riſe to a moſt ſevere and extenſive raſh all over the body, attended with alarming indiſpoſition. This complaint is noticed in the article ERYTHEMA, and is one with which every ſurgeon ſhould be well acquainted.

The preciſe manner in which memory acts in checking and curing ſyphilitic diſeaſes, has been the ſubject of various conjectures. Some writers fancy that it muſt operate by neutralizing the virus, juſt as an alkali deſtroys an acid. Others, ſeeing that mercury only exerted an anti-venereal quality, when combined with oxygen, have endeavoured to account for the action of this mineral, by the quantity of oxygen which it conveys with it into the ſyſtem. Againſt the firſt of theſe ſuppoſitions it is argued, that mercury cannot act by neutralizing the virus, ſince its effect would then always correſpond with the quantity introduced into the ſyſtem. This experience contradicts, and the Hunterian doctrines lead us to conclude, that the virus does not long remain in the conſtitution, after contaminating the parts, and communicating to them the diſpoſition which is afterwards to come into action. Againſt the ſecond opinion it may be obſerved, that though mercury has no effect in its ſimple ſtate, yet thoſe mercurial preparations which have the moſt power over ſyphilis, are ſuch as are combined with the ſmalleſt quantity of oxygen. Beſides, there are other ſubſtances which contain infinitely more oxygen than mercurial medicines, and yet have not gained the celebrity and confidence which ſurgeons place in mercury, as an antidote for ſyphilis. There can be no doubt, however, that the nitric and nitrous acids, the oxygenated muriatic acid, and the oxygenated muriate of potaſſa, ſubſtances which largely abound in oxygen, are in a certain degree anti-ſyphilitic, though they cannot be depended upon ſo much as mercury. With reſpect to the *modus operandi* of mercury, it was Mr. Hunter's belief, that this mineral produced in the conſtitution an irritation which counteracted the venereal and entirely deſtroyed it. Treatiſe on Ven. Diſeaſe, p. 365.

The indiſcrete and immoderate employment of mercury ſometimes gives riſe to diſeaſes, which are very liable to be miſtaken for continuations of the ſyphilitic affection, for which that remedy was at firſt preſcribed. Mr. Hunter himſelf confeſſes that theſe caſes puzzle conſiderably, it being difficult to ſay when the venereal action is abſolutely deſtroyed. He obſerves, that ſuch complaints are moſt common in the throat; for while a mercurial courſe is going on, and the ulcer on the tonſils healing, or even healed, theſe parts will ſometimes ſwell, and excoriations occur and ſpread over the whole palatum molle. Mr. Hunter believed that ſuch excoriations, as well as other appearances of diſeaſe coming on during the uſe of mercury, were ſeldom or never venereal. Hence he recommended mercury to be continued no longer than was ſufficient to overcome the original ſyphilitic diſeaſe. In theſe caſes, he thought that bark was often of ſervice, and that it might be uſefully given, either with the mercury, or after the mercurial courſe was over.

Frequently venereal abſceſſes will not heal up, though they have become conſiderably better; for while the ſyphilitic actions remained in the part, mercury diſpoſed that part to heal; but under the mercurial courſe, the conſtitution and part had acquired another diſpoſition, proceeding (to uſe Mr. Hunter's language) from a venereal and mercurial irritation, affecting a particular habit of body, or part, at the time which new diſpoſition differs from the venereal, mercurial, and natural, being a fourth diſpoſition ariſing out of all the three. Mercury, when continued under ſuch circumſtances, acts as a poiſon, and makes the local diſeaſe grow worſe and ſpread. Some of the ſores, formed in this way, not only reſiſt all means of cure, but often inflame, ulcerate, and produce hard callous baſes, ſo as to put on a cancerous appearance. New diſeaſes may ariſe from mercury alone, as ſwelling of the tonſils, unattended with any ſyphilitic diſeaſes, thickenings of the perioſteum, and œdema, and ſoreneſs of the parts over the bones. Theſe complaints, ariſing under a courſe of mercury, are too often regarded as venereal, and that mineral puſhed to the utmoſt extent. If mercury has already been given ſufficiently to cure the original diſeaſe, it ought to be now immediately left off, and not continued for theſe incidental affections, which will be rendered worſe by it. If, after the cure of ſuch maladies, the venereal diſeaſe ſhould begin to come into action again, mercury muſt be given a ſecond time. Mr. Hunter ſuſpected that the diſorders of the tonſils and perioſteum, above alluded to, originated from ſcrofula, and he entertained a favourable opinion of bark and ſea-bathing for their relief. P. 369—371. The terrible forms of diſeaſe, which we every day ſee ſyphilitic complaints converted into by raſh local and mercurial treatment, are really deplorable. The worſt phagedenic buboes, and deſtructive ſloughing chancres, and other ulcers, are often more owing to the wrong continuance and immoderate exhibition of mercury, and bad local treatment, than any original fault in the habit.

From mercury, we proceed to notice a few of the other principal remedies which have obtained repute for their anti-ſyphilitic virtues.

Guaiacum is the medicine with which the natives of the Weſt Indies are ſaid to have cured ſyphilitic affections before theſe diſeaſes made their appearance in Europe. Many writers of the 16th century contended that guaiacum was a true ſpecific for the venereal diſeaſe; and the celebrated Boerhaave, in the 18th, maintained the ſame opinion. We learn from Mr. Pearſon that he was firſt entruſted with the care of the Lock hoſpital in 1781. Mr. Bromfield and Mr. Williams were in the habit of repoſing great confidence in the efficacy of a decoction of guaiacum wood. This was adminiſtered to ſuch patients as had already employed the uſual quantity of mercury; but who complained of nocturnal pains, or had gummata, nodes, ozæna, and ſuch other effects of the venereal virus connected with ſecondary ſymptoms, as did yield to a courſe of mercurial frictions. The diet conſiſted of raiſins and hard biſcuit; from two to four pints of the decoction were taken every day; the hot-bath was uſed twice a week; and a doſe of antimonial wine and laudanum, or of Dover's powder, was commonly taken every evening. Conſtant confinement to bed was not deemed neceſſary; neither was expoſure to the vapour of burning ſpirit, with a view of exciting perſpiration, often practiſed, as only a moiſt ſtate of the ſkin was deſired. This treatment was ſometimes of ſingular advantage to thoſe whoſe health had ſuſtained injury from the diſeaſe, long confinement, and mercury. The ſtrength increaſed; bad ulcers healed; exfoliations were completed; and theſe anomalous ſymptoms, which would have been exaſperated by mercury, ſoon yielded to guaiacum.

Beſides ſuch caſes, in which the good effects of guaiacum made it to be regarded as a ſpecific for lues venerea, the medicine was alſo formerly exhibited by ſome practitioners on the firſt attack of the venereal diſeaſe. The diſorder, being thus benefited, a radical cure was conſidered to be accompliſhed; and though frequent relapſes followed, yet as theſe partly yielded to the ſame remedy, its reputation was ſtill kept up. Many diſeaſes, alſo, which got well, were probably not really venereal caſes. Mr. Pearſon ſeems to allow, that, in ſyphilitic affections, it may, indeed, operate like a true antidote, ſuſpending, for a time, the progreſs of certain venereal ſymptoms, and removing other appearances altogether; but he obſerves, that experience has evinced that the unſubdued virus yet remains active in the conſtitution.

Mr. Pearſon has found guaiacum of little uſe in pains of the bones, except when it proved ſudorific; but that it was then inferior to antimony or volatile alkali. When the conſtitution has been impaired by mercury and long confinement, a thickened ſtate of the ligaments, or perioſteum, or foul ulcers, ſtill remaining, Mr. Pearſon ſays, theſe effects will often ſubſide during the exhibition of the decoction. He ſays, it will often ſuſpend, for a ſhort time, the progreſs of certain ſecondary ſymptoms of the lues venerea; for inſtance, ulcers of the tonſils, venereal eruptions, and even nodes. Mr. Pearſon, however, never knew one inſtance in which guaiacum eradicated the virus; and he contends, that its being conjoined with mercury, neither increaſes the virtue of this mineral, leſſens its bad effects, nor diminiſhes the neceſſity of giving a certain quantity of it. Mr. Pearſon remarks, that he has ſeen guaiacum produce good effects in many patients having cutaneous diſeaſes, the ozæna, and ſcrofulous affections of the membranes and ligaments. See Pearſon on the Effects of various Articles in the Cure of Lues Venerea, edit. 2. 1807.

Mezereon was recommended by Dr. A. Ruſſel for a particular claſs of venereal ſymptoms, in the following terms: "The diſeaſe, for which I principally recommend the decoction of the mezereon root as a cure, is the venereal node that proceeds from a thickening of the membrane of the bones. In a thickening of the perioſteum, from other cauſes, I have ſeen very good effects from it: and it is frequently of ſervice in the removal of thoſe nocturnal pains with which venereal patients are afflicted; though, in this laſt caſe, excepting with regard to the pain that is occaſioned by the node, I own I have not found its effects ſo certain, as I at firſt thought I had reaſon to believe. I do not find it of ſervice in the cure of any other ſymptom of the venereal diſeaſe." (Med. Obſ. and Inq. vol. iii. p. 194, 195.) Mr. Pearſon, however, aſſerts, unequivocally, that mezereon has not the power of curing the venereal diſeaſe in any one ſtage, or under any one form, and if the decoction ſhould ever reduce a venereal node, yet there will be a neceſſity for taking mercury in as large quantity, and for as long a time as if no mezereon had been exhibited. Cullen found this medicine of uſe in ſome cutaneous affections, but excepting an inſtance or two of lepra, Mr. Pearſon has very ſeldom found it poſſeſſed of medicinal virtue, either in ſyphilis, or the ſequelæ of that diſeaſe, ſcrofula, or cutaneous affections. The root of ſarſaparilla was brought into Europe about 1530. It was at firſt reputed to poſſeſs ſingular efficacy in venereal caſes; but afterwards loſt all its fame. Sarſaparilla was again brought into notice by Dr. W. Hunter, who adviſed Dr. Chapman to make trial of it in a bad caſe of phagedenic bubo; and the benefit obtained in this inſtance led Dr. Hunter to extend the recommendation of the medicine. Sir William Fordyce ſtated, that ſarſaparilla would quickly relieve venereal head-achs and nocturnal pains, and, if perſiſted in, cure them; that, in emaciated or conſumptive habits, from a venereal cauſe, it was the greateſt reſtorer of appetite, fleſh, colour, and ſtrength, which he knew of; that when mercurial frictions had been previouſly employed, it would generally complete the cure of diſeaſe of the throat, noſe, palate, or ſpongy bones; and that it would promote the cure of blotches and ulcers, ſometimes accompliſh it, *even without mercury;* though, in this circumſtance, there was danger of a relapſe. Sir W. Fordyce ſaid, ſarſaparilla was of little uſe in chancres; but when theſe, or buboes, would not heal, after the employment of mercury, it would often cure, and always do good. He allows, however, that in all venereal caſes "ſarſaparilla is not to be truſted to, unleſs preceded by, or combined with, the uſe of mercury:" and he thought ſarſaparilla would probably always cure what reſiſted mercury. Medical Obſ. and Inq. vol. i.

The celebrated Cullen conſidered ſarſaparilla as poſſeſſing no virtues of any kind; for (ſays he) "tried in every ſhape I have never found it an effectual medicine in ſyphilis, or any other diſeaſe." Mat. Med. vol. ii.

Mr. Bromfield declares, that he never ſaw a ſingle inſtance in which ſarſaparilla cured the venereal diſeaſe without the aid of mercury, either given before, or in conjunction with it. (Pract. Obſ. on the Uſe of Corroſive Sublimate, &c. p. 78.) Mr. Pearſon alſo "contends, that ſarſaparilla has not the power of curing any one form of the lues venerea;" but he allows that it may ſuſpend for a time the ravages of that contagion, the diſeaſe returning if no mercury ſhould have been uſed. This gentleman admits, alſo, that ſarſaparilla will alleviate ſymptoms derived from the venereal virus. He maintains, that the exhibition of ſarſaparilla does not diminiſh the neceſſity for giving leſs mercury. Nocturnal pains in the limbs, painful enlargements of the elbow and knee, membranous nodes, cutaneous ulcerations, and certain other ſymptoms, reſembling venereal ones, are often experienced after a full courſe of mercury. Such complaints, Mr. Pearſon allows, are greatly benefited by ſarſaparilla, and exaſperated by mercury; and he obſerves, that it is from theſe complaints having been miſtaken for venereal ones, that the idea has ariſen, that ſarſaparilla has cured ſyphilis when mercury had failed. Mercury, and the venereal poiſon, may jointly produce, in certain conſtitutions, ſymptoms which are not ſtrictly venereal, and are ſometimes more dreadful than the ſimple effects of ſyphilis. Some of the worſt of theſe appearances are capable of being cured by ſarſaparilla, while the venereal virus ſtill remains in the ſyſtem. When this latter diſeaſe has been eradicated by mercury, ſarſaparilla will alſo cure the ſequelæ of a courſe of the other medicine. Pearſon on the Effects of various Articles in the Cure of Lues Venerea, 1807.

China-root once obtained the character of being a certain ſpecific for ſyphilitic complaints. Its reputation roſe very high, in conſequence of its having been reported to have cured the emperor Charles V. At preſent its medicinal virtues are eſtimated very low indeed; and it ſeems to have now loſt all its advocates. It was firſt uſed in practice about the year 1535.

Cinchona, or the Peruvian bark, has no ſpecific virtue in ſyphilitic caſes, but, according to Mr. Pearſon, if it has been alleged upon plauſible grounds, that guaiacum poſſeſſes medicinal efficacy in venereal pains; ſarſaparilla, where there are phagedenic ulcers; and mezereon, in caſes where there are membranous nodes; ſo bark has a claim to praiſe for its ſalutary agency in incipient buboes, in ulcers of the tonſils, and in gangrenous ulcers from a venereal cauſe. This gentleman has ſeen venereal buboes reduced, though not cured, by it; ſyphilitic ulcers in the throat healed by it, though the diſeaſe recurred; and ſudden mortifications of the penis from chancres terminate in a cure of the diſtemper, with the exhibition of bark, unaſſiſted by mercury. In theſe laſt caſes, Mr. Pearſon conjectures, that, as the extinction of the venereal poiſon could not be aſcribed to the ſpecific virtues of the bark, the abſorption of the virus muſt have been anticipated and prevented by the death of the part. This gentleman acknowledges, however, that there are gangrenous chancres met with, where, after the detachment of the ſloughs, the ſpecific diſeaſe in the part continues, and the ulcer ſpreads, ſo that mercury is indiſpenſable.

Opium has been ſaid to be a ſpecific in venereal caſes; and in the firſt volume of the Medical Communications, ſome facts were publiſhed in ſupport of this opinion. But in the years 1784 and 1785, Mr. Pearſon made ſeveral experiments on the virtues of opium in lues venerea, at the Lock hoſpital. Theſe are related in the ſecond volume of the preceding work. The reſult was very unfavourable to the character of opium as an anti-venereal. In a later work, the ſame gentleman obſerves that he has been long accuſtomed to adminiſter opium with great freedom, during the mercurial courſe; and the experience of more than twenty years has taught him, that when this medicine is combined with mercury, the proper efficacy of the latter is not in any meaſure increaſed; that it would not be ſafe to rely upon a ſmaller quantity of the ſpecific mineral, nor to ſhorten the mercurial courſe at all more, than where no opium has been employed. (On Lues Ven., p. 68, 69.) Though opium may poſſeſs no anti-ſyphilitic virtue, it is unqueſtionably uſeful on other principles, in many venereal caſes. It often prevents mercury from diſordering the ſtomach and bowels; and it will frequently leſſen the irritability and reſtleſsneſs produced by the introduction of mercury into the conſtitution. But, regarded as a ſpecific for ſyphilitic affections, we may conclude with Mr. Hunter, that it has no effect, till mercury has done its beſt, or its worſt. This latter ſurgeon owns that opium has certainly conſiderable effects in many diſeaſes, both in ſuch as are conſequent to the venereal diſeaſe, and in others ariſing from different cauſes. It had long been a favourite medicine with him, not only as relieving pain, but as capable of altering diſeaſed actions. In all ſores attended with irritability, he ſays, a decoction of poppy heads, made into a poultice, is an excellent application. He tells us, he had even ſeen two doubtful ſyphilitic caſes cured by the internal exhibition of opium: but on his trying this plan in an unequivocal caſe of venereal blotches and ſore throat, ſo far was opium from producing the deſired effect, that, after a perſeverance of three weeks, the ſores were rather worſe. Treatiſe on Venereal Diſeaſe, p. 373.

Dr. Storck has related ſome caſes, in which cicuta, or hemlock, is ſtated to have cured ſyphilis, when other remedies had failed. (Lib. ii. De Cicutâ.) At preſent it ſeems to have loſt its character, as poſſeſſing any ſpecific virtue over the venereal diſeaſe. It is not, however, a medicine without its uſes. According to Mr. Pearſon, the extract and the powder of hemlock may be ſometimes advantageouſly given in ſpreading irritable ſores, whether they are connected with the active ſtate of the venereal virus, or they remain after the completion of the mercurial courſe. Cicuta ſometimes does good, when opium will not; and, therefore, Mr. Pearſon thinks it may have other virtues than thoſe depending upon its anodyne qualities. P. 75.

For remarks on the anti-venereal effects of ſaſſafras, juniperus, bardana, ſaponaria, dulcamara, juglans, lobelia ſyphilitica, aſtragalus exſcapus, ammonia præparata, barytes muriata, &c. we muſt refer to Mr. Pearſon's publication.

A decoction of the green rind of the walnut ſeems worthy of more attention than ſeveral other articles. The laſt author ſays he has employed it, during many years, where pains in the limbs and indurations of the membranes have remained, after the venereal diſeaſe has been cured by mercury, and ſeldom without manifeſt advantage. P. 81.

The decoction of the woods and the Liſbon diet drink are famous preſcriptions in ſyphilitic caſes. Where the diſeaſe is doubtful, or mercury diſagrees, or is done with, ſuch remedies may certainly be often taken with benefit.

No. 1.

℞ Sarſaparillæ conciſæ.
Ligni ſaſſafras.
Ligni ſantali rubri.
Ligni guaiaci officinalis, ſing. unc. iſſ.
Radicis mezerei
Seminum coriandri ſing. unc. ſſ.
Aquæ diſtillatæ, lib. x.

Theſe are to be boiled till only half the fluid remains. The doſe is a quart, or more, in the day.

No. 2.

℞ Sarſaparillæ conciſæ.
Ligni ſantali rubri.
Ligni ſantali citrini ſing. unc. iſſ.
Radicis glycyrrhizæ.
Radicis mezerei ſing. ʒij.
Ligni rhodii.
Ligni guaiaci officinalis.
Ligni ſaſſafras ſing. unc. ſſ.
Antimonii unc. j.
Aquæ diſtillatæ, lib. v.

Theſe ingredients are to be macerated for twenty-four hours, and afterwards boiled till the fluid is reduced to half its original quantity. From one to four pints are given daily.

Beſides the preceding, Mr. Hunter has alſo noticed the following formula in his Treatiſe on the Venereal Diſeaſe.

No. 3.

℞ Sarſaparillæ conciſæ.
Radicis chinæ, ſing. unc. j.
Nucum juglandis cortice ſiccatarum, N° xx.
Antimonii unc. ij.
Lapidis pumicis pulverizati unc. j.
Aquæ diſtillatæ, lib. x.

The powdered antimony and pumice ſtone are to be tied in ſeparate pieces of rag, and boiled along with the other ingredients.

This laſt decoction is reckoned to be the *genuine* Liſbon diet drink, whoſe qualities have been the ſubject of ſo much encomium. Pharm. Chirurg.

The muriatic and ſulphuric acids have been exhibited in venereal caſes with ſome advantage, as they are capable of improving the appearance of ſyphilitic ulcers, and reſtraining for a time the progreſs of the diſeaſe.

But the nitrous and nitric acids have gained the greateſt repute for their anti-venereal qualities. Theſe acids have been tried by Dr. Rollo, Mr. Cruikſhank, Dr. Beddoes, Mr. Blair, and many others, as ſubſtitutes for quickſilver, in the cure of lues venerea. The practice began with Mr. Scott, a ſurgeon in Bengal, who is ſaid to have derived the idea from Girtanner, who ſuggeſted that the efficacy of the various preparations of quickſilver might ariſe from the oxygen which they contained.

A multitude of caſes have been brought forward in favour of nitric acid, as an anti-ſyphilitic; but there are alſo ſome others adduced, which ſeem very decidedly to controvert its claims to that character. It ſhould be carefully remembered, that it is the *nitric* acid, not the *nitrous*, which ſeems to deſerve a further trial in ſyphilitic caſes.

The common way of giving the nitric acid, at firſt, is to mix ʒj with a pint of diſtilled water, the mixture being ſweetened with ſimple ſyrup. This quantity is to be drank, at different times, in the courſe of twenty-four hours, through a ſmall glaſs tube, which is uſed to keep the teeth from being injured. If no inconvenience is felt, the doſe of the acid may be increaſed to ʒiſſ, ʒij, and even, in certain caſes, to ʒiij.

The acid is ſaid to increaſe the appetite, and ſecretion of urine; to cauſe more or leſs thirſt, a white tongue, ſizy blood, and an increaſe in the actions of the whole ſyſtem, but nothing like mercurial ſalivation is produced. It does not agree, however, equally well with all conſtitutions.

The nitric acid is beneficial both in the *primary* and *ſecondary* ſymptoms of the venereal diſeaſe; more ſo, however, in the former. But, in the latter, even mercury itſelf frequently fails, and proves hurtful, ſo that the nitric acid ſuffers no diſparagement from this fact. A change is ſaid to be produced on the diſeaſe, by the acid, in ſix or eight days, and a cure very often in little more than a fortnight.

The oxygenated muriate of potaſh, which contains an immenſe quantity of oxygen, is ſaid by Mr. Cruikſhank to be more efficacious than the nitric acid, in relieving venereal ſymptoms.

Richerand informs us, that experiments, confirming the ſuperior efficacy of mercury, in the cure of ſyphilis, were made for the ſpace of a year, in the hoſpital of the Ecole de Médicine at Paris, before a committee of gentlemen expreſsly appointed for the purpoſe. It is ſtated, that ſome patients derived only temporary relief from the oxygenated fat and nitric lemonade; that a very few got quite well; and that others, after appearing to be entirely rid of the diſeaſe, ſuffered ſuch relapſes as evinced the ſuperiority of the ordinary method. Noſographie Chir. tom. i. p. 352. edit. 2.

It appears to us, that there is one very important circumſtance made out by the trials of various medicines in the treatment of the venereal diſeaſe. According to the Hunterian opinions, we are to ſuppoſe that it is the invariable character of the diſtemper to proceed regularly from bad to worſe, unleſs checked by the ſpecific remedy, mercury. This doctrine is taught in ſome of the preſent ſchools, and ſeems to be adopted by Dr. Adams in his work on morbid poiſons. Were this idea a matter of fact, it would be of material conſequence in practice; for, in many difficult and ambiguous caſes, we might often form a juſt deciſion, by obſerving whether the complaints recede at all, without the aid of mercury; ſince, if they do ſo, they cannot in reality be ſyphilitic. This aſſertion, however, is by no means eſtabliſhed; and from the obſervations publiſhed by Pearſon, and other writers, on the effects of different remedies on the diſeaſe, we are to conclude that it is erroneous. The remarks, which we have quoted above, tend to ſhew that, even under the mere adminiſtration of bark, venereal buboes and ſyphilitic ulcers in the throat may ſometimes be healed. The teſtimony of Mr. Pearſon alſo confirms, that the muriatic and ſulphuric acids will improve venereal ſores, and reſtrain for a time the progreſs of the diſeaſe. The committee at the Ecole de Médicine, we find, announce that ſome few cures were effected by oxygenated lard and nitric lemonade. Theſe ſtatements, joined with the large body of reſpectable evidence from ſeveral other quarters already ſpecified, cannot fail to induce a ſuſpicion, that many medicines, beſides mercury, have a certain degree of power in reſiſting the ravages of the venereal diſeaſe; and that even ſyphilitic buboes and ulcers will ſometimes recede, look better, and heal, without mercury. We do not wiſh to inſinuate, that theſe things are deciſively eſtabliſhed; the diagnoſis of true venereal complaints being often ſo difficult, that men of great judgment and experience are liable to miſtakes.

Obſervations on the Treatment of particular Symptoms.

Treatment of Chancres.—Before the virus has been taken up by the abſorbents, a chancre is ſtrictly a local affection, quite unattended with any contamination of other parts. In this ſtate, there can be no doubt that there is a poſſibility of accompliſhing a cure by deſtroying with cauſtic the ſore, and adjacent part affected with the venereal action. Such an endeavour muſt be the more likely to ſucceed, when it is made while a chancre is ſmall, and in an incipient ſtate. The argentum nitratum is commonly employed for this purpoſe: but perhaps it might be preferable to uſe the kali purum and quicklime, which operate with more effect and quickneſs. Unfortunately, the period at which the abſorption of the virus begins is ſo uncertain, that the foregoing method is ſcarcely ever deſerving of ſuch implicit reliance, that mercury need not be employed at all. Small puſtules and ulcerated points on the penis are frequently deſtroyed with cauſtic, and a laſting cure is effected without mercury. Poſſibly ſome of theſe caſes may not be venereal; and when the practitioner infers that he has ſucceeded in preventing the abſorption of the virus, he may be deceived. In other inſtances, the endeavour to ſuperſede all occaſion for mercury, by extirpating a chancre with cauſtic, is only attended with a temporary appearance of ſucceſs; ulcerations of the tonſils, and other ſymptoms, denoting a general affection of the conſtitution, coming on ſoon after the healing of the ſore. Hence it is generally deemed prudent, not to be content with the attempt at extirpation with cauſtic, but to exhibit, at the ſame time, for a few weeks, the pil-hydrargyri. The mercury may ſometimes, indeed, be given unneceſſarily; but with its exhibition, and the cauſtic, the patient has a double chance of ſecurity againſt the extenſion of the diſeaſe to his conſtitution.

We ſhall firſt conſider the topical application to chancres.

Mercurial ointments have been commonly uſed as dreſſings to chancres; but Mr. Hunter was of opinion, that if the mercury were joined with watery ſubſtances, inſtead of oily ones, the application, by mixing with the matter, would be continued longer to the ſore, and would prove more effectual. This, he obſerves, is one advantage, which poultices have over common dreſſings. He has often uſed mercury rubbed down with ſome conſerve inſtead of ointment, and it anſwered extremely well. Calomel uſed in the ſame way, and alſo the other preparations of mercury mixed with mucilage, or honey, anſwer the ſame purpoſe. Such dreſſings, according to Mr. Hunter, will effect a cure in caſes which are truly venereal, and free from other morbid tendencies.

Some chancres are indolent, and require a little warm balſam or red precipitate to be joined with the mercurial dreſſing. Mr. Hunter ſays, that calomel mixed with ſalve is more active than common mercurial ointment, and is attended with better effects, when the caſe requires ſtimulants.

Solutions of blue vitriol, verdigris, calomel, &c. have been recommended. But Mr. Hunter very judiciouſly obſerves,

ſerves, that, as all theſe applications are only of ſervice in remedying any peculiar diſpoſition of the parts, as they have no ſpecific power over the venereal poiſon, and as ſuch diſpoſitions are innumerable, it is almoſt impoſſible to ſay what applications will be effectual in every inſtance. Some kinds of dreſſings will anſwer in one ſtate of the ſore; ſome in another. The parts affected are often found extremely irritable, in which circumſtance the mercury ſhould be mixed with opium or preparations of lead.

Mr. Hunter was an advocate for changing the dreſſings very often, becauſe the matter ſeparates them from the ſore, ſo as to diminiſh their effects. He ſtates, that changing the applications thrice a day, will not be found too often, particularly when they are in the form of an ointment.

When the venereal nature of a chancre is removed, the ſore frequently becomes ſtationary, in which caſe Mr. Hunter obſerves, that new diſpoſitious have been acquired, and the quantity of diſeaſe in the part has been increaſed. When chancres are only ſtationary, Mr. Hunter ſays, they may often be cured, by touching them ſlightly with the lunar cauſtic. No cicatrization, in this caſe, ſeems poſſible, till the contaminated ſurface, or the new fleſh, which grows on that ſurface, has either been deſtroyed or altered. It is often ſurpriſing, how quickly the ſores heal up, after being touched with the application.

At the ſame time that topical applications are made to chancres, mercury muſt be internally exhibited, both with a view of curing theſe ulcers, and preventing a lues venerea. Mr. Hunter believed, that the venereal diſpoſition of the chancre would hardly ever withſtand both local and internal mercurials.

When local applications cannot eaſily be made to chancres, as in caſes of phymoſis, there is a ſtill greater neceſſity for giving mercury internally, by which means, the cure may in the end be effected.

Mercury ſhould always be given internally in every caſe of chancre, let it be ever ſo ſlight, and even when the ſore has been deſtroyed on its very firſt appearance. The remedy ſhould always be exhibited the whole time of the cure, and continued ſome time after the chancre has healed; for, ſays Mr. Hunter, as there are, perhaps, few chancres without abſorption of the matter, it becomes abſolutely neceſſary to give mercury to act internally, in order to hinder the venereal diſpoſition from forming. How much mercury ſhould be thrown into the conſtitution in the cure of a chancre, with a view of keeping the ſyſtem from being affected, cannot eaſily be determined, as there is no diſeaſe actually formed, by which we can be guided. Mr. Hunter ſtates, that the quantity muſt in general be proportioned to the ſize, number, and duration of the chancres; or, in other words, proportioned to the opportunity, which there has been given for abſorption.

The mercury, which is exhibited to act internally, may be conveyed into the ſyſtem, either by the ſkin, or ſtomach, according to circumſtances, and it ſhould be ſo taken, as to produce a ſlight affection of the mouth.

Mr. Hunter next remarks, that when the ſore has put on an healthy look, when the hard baſis has become ſoft, and the ulcer has ſkinned over in a favourable manner, it may be regarded as cured.

The ſame diſtinguiſhed writer notices, however, that in very large chancres, it may not always be neceſſary to continue the application of mercury, either for external or internal action, till the ſore is healed, for the venereal action is juſt as ſoon deſtroyed in a large chancre, as it is in a ſmall one, ſince every part of the ſore is equally affected by the medicine, and, of courſe, cured with equal expedition. But, in regard to cicatrization, circumſtances are different, becauſe a large ſore is longer than a ſmall one, in becoming covered with ſkin. Hence Mr. Hunter very juſtly explains, that a large chancre may be deprived of its venereal action long before it has healed; while, on the other hand, a ſmall one may heal before the ſyphilitic affection has been deſtroyed. In the latter caſe, this gentleman repreſents it as moſt prudent, both on account of the chancre and conſtitution, to continue the employment of mercury a little while after the ſore has healed.

Mr. Hunter, in the valuable work which he has left on the preſent ſubject, takes notice of ſloughs, which occur in the tonſils, from the effect of mercury on the throat, and are apt to be miſtaken for venereal complaints. He alſo mentions, that ſometimes, when the original chancre has been doing well, and been nearly healed, he has ſeen new ſores break out on the prepuce, near the firſt, and aſſume all the appearance of chancres.

When, in the treatment of chancres, a bubo ariſes, while the conſtitution is loaded with a ſufficient quantity of mercury to cure ſuch ſores, which medicine has alſo been rubbed into the lower extremity, on the ſame ſide as the bubo, Mr. Hunter ſuſpected, that the ſwelling in the groin is not venereal, but is produced by the mercury. In theſe caſes, he always preferred conveying mercury into the ſyſtem in ſome other manner.

With reſpect to the treatment of chancres in women, ſince it is difficult to keep dreſſings on the parts, Mr. Hunter adviſes the ſores to be frequently waſhed with ſome mercurial ſolution, and ſpeaks of one made with corroſive ſublimate, as perhaps being the beſt, ſince it will act as a ſpecific, and ſtimulant alſo, when this is requiſite. When the chancres, however, are irritable, they are to be treated in the ſame manner, as ſimilar complaints in men. When the ſores extend into the vagina, this paſſage muſt be kept from becoming conſtricted, or cloſed, by the introduction of lint.

Sometimes, after a chancre and all venereal diſeaſe are cured, the prepuce continues thickened and elongated, ſo that the glans cannot be uncovered. Perhaps, the caſe is often without remedy. Mr. Hunter, however, very properly recommends trying every poſſible means, and he informs us, that the ſteam of warm water, hemlock fomentations, and cinnabar fumigations, are frequently of ſingular ſervice.

When the thickening and enlargement of the prepuce cannot be removed by applications, all the portion, anterior to the glans penis, may be cut away. See PHYMOSIS.

Mr. Hunter has very ably explained, that chancres, both in men and women, often acquire, during the treatment, new diſpoſitions, which are of various kinds, ſome retarding the cure, and leaving the parts in an indolent thickened ſtate, after the cure is accompliſhed. In other inſtances, a new diſpoſition ariſes, which utterly prevents the parts from healing, and often produces a much worſe diſeaſe, than that from which it originated. Such new diſpoſitions may lead to the growth of tumours. They are more frequent in men than women, and generally occur only when the inflammation has been violent from ſome peculiarity of the parts, or conſtitution. They have ſometimes been conſidered as cancerous.

Among the diſeaſes in queſtion, Mr. Hunter notices thoſe continued, and often increaſed inflammations, ſuppurations, and ulcerations, which become diffuſed through the whole prepuce, and alſo along the common ſkin of the penis, which become of a purple hue, attended with ſuch a general thickening of the cellular membrane, as makes the whole organ appear conſiderably enlarged. The ſame writer obſerves, that the ulceration on the inſide of the prepuce will ſometimes increaſe, and run between the ſkin and the body of the penis, and eat holes through in different places, till the whole is reduced to a number of ragged ſores. The glans often ſhares the ſame fate, till more or leſs of it is gone. Frequently, the urethra in this ſituation is wholly deſtroyed by ulceration, and the urine is diſcharged ſome way farther back. The ulceration, if unchecked, at length deſtroys all the parts. In this acute caſe, prompt relief is demanded; but often the proper mode of treatment cannot be at once determined, owing to our ignorance, in reſpect to the exact nature of the peculiar cauſe of the diſeaſe. Mr. Hunter ſtates, that the decoction of ſarſaparilla is often of ſervice, when given in large quantities, and that he has known the German diet-drink effect a cure, after every other remedy had failed.

Mr. Hunter alſo ſtates, that the extract of hemlock is ſometimes of ſervice, and that he has known ſea-bathing effect a perfect cure.

Sometimes, when ſuch ſores are healing, it becomes neceſſary to keep the orifice of the urethra from cloſing, by the introduction of a bougie.

Sometimes, after a chancre has healed, the cicatrix breaks out again, and puts on the appearances of the preceding ſore. Occaſionally, ſimilar diſeaſes break out in different places from that of the cicatrix. Mr. Hunter repreſents, that they differ from a chancre in generally not ſpreading ſo faſt, nor ſo far; in not being ſo painful, nor ſo much inflamed; in not having ſuch hard baſes, as venereal ſores have; and in not producing buboes. This writer was of opinion, that they were not venereal. They are very apt to recur.

Mr. Hunter does not ſpecify any particular mode of cure for all theſe caſes; but he mentions one inſtance, which ſeemed to be cured by giving forty drops of the lixivium ſaponarium, every evening and morning, in a baſin of broth; and he adverts to another caſe, which was permanently cured by ſea-bathing.

In ſome inſtances, after a chancre has healed, the parts, as Mr. Hunter remarks, do not ulcerate; but appear to become thickened and indurated. Both the glans and prepuce ſeem to ſwell, ſo as to form on the end of the penis a tumour, or excreſcence, ſhaped very much like a cauliflower, and, when cut into, ſhewing radii, running from its baſe, or origin, towards the external ſurface. It is extremely indolent. It is not always a conſequence of the venereal diſeaſe; for Mr. Hunter has ſeen it ariſe ſpontaneouſly.

No medicine ſeems to be at all likely to cure the diſeaſe: the only ſucceſsful means is to amputate a conſiderable part of the penis, and then to keep a proper catheter introduced into the urethra.

Warts.—Chancres often induce a diſpoſition to the formation of warts on the penis. We have in a former column ſtated our belief, that they are not venereal, though ſometimes curable by mercury. Hunter ſeems to think them not ſyphilitic, and we never have ſeen any which could not be cured without mercury, and this without the continuance of the original diſeaſe in any other form.'

Theſe ſubſtances are excreſcences from the body, they are not to be conſidered as truly a part of the animal, not being endowed with the common, or natural animal powers. Many trifling circumſtances make them decay. An inflammation of the ſound parts round the wart, or ſtimuli applied to its ſurface, will often make it die. Electricity will alſo induce an action in ſuch excreſcences, which they are not able to ſupport; an inflammation is excited round them, and they drop off.

From this account, we muſt perceive, according to Mr. Hunter, that the knife and eſcharotics are not always neceſſary, although theſe modes will act more quickly than any other, eſpecially when the neck of the wart is ſmall. When ſuch is the form of the excreſcence, perhaps a pair of ſciſſars is the beſt inſtrument; but, ſays the above diſtinguiſhed writer, when cutting inſtruments of any kind are horrible to the patient, a ſilk thread, tied round the neck of the wart, will do very well. However, whichever plan is adopted, it is in general neceſſary to touch with cauſtic the baſe of the little tumour, after this has ſeparated.

Mr. Hunter remarks, that eſcharotics act upon warts in two different ways, *viz.* by deadening a part, and ſtimulating the remainder, ſo that, by the application of eſcharotic after eſcharotic, the whole excreſcence decays moderately faſt; and it is ſeldom neceſſary to deſtroy them down to the very root, which is often thrown off. This, however, is not always the caſe, and the wart grows again, in which circumſtance, it is proper to let the cauſtic deſtroy even the root itſelf.

The kali purum cum calce vivâ, lunar cauſtic, and blue vitriol, are all proper applications. But one of the beſt ſtimulants is the ærugo æris and powder of ſavin-leaves, mixed together.

Treatment of Buboes.—When a bubo is certainly a venereal one, and only in an inflamed ſtate, an attempt is to be made to reſolve the ſwelling. The propriety of the attempt, however, depends on the progreſs which the diſeaſe has made. If the bubo be very large, and ſuppuration appears to be near at hand, reſolution is not likely to be effected. When ſuppuration has already taken place, Mr. Hunter much doubted the probability of any ſucceſs attending the endeavour, which now might poſſibly only retard the ſuppuration, and protract the cure.

The reſolution of theſe inflammations, ſays Mr. Hunter, depends principally on mercury, and almoſt abſolutely on the quantity which can be made to paſs through them. When ſuppuration has taken place, the cure alſo depends on the ſame circumſtances.

The quantity of mercury, which can be made to paſs through a bubo, is repreſented by Mr. Hunter as depending principally on the quantity of external ſurface for abſorption beyond the bubo.

The mercury is to be applied to ſuch ſurfaces as allow the remedy, when abſorbed, to paſs through the diſeaſed gland. In this manner, the diſeaſe in the groin is ſubdued, and the conſtitution is leſs liable to be contaminated.

However, Mr. Hunter accurately notices, that the ſituation of many buboes is ſuch, as not to have much ſurface for abſorption beyond them; for inſtance, the buboes on the body of the penis ariſing from chancres on the glands, or prepuce.

When the bubo is in the groin, Mr. Hunter recommends ſurgeons to pay attention to whether the ſwelling is in the upper part of the thigh and groin, on the lower part of the belly, before Poupart's ligament, or near the pubes. When the buboes are ſituated on the body of the penis, the abſorbents leading directly from the ſeat of abſorption are themſelves diſeaſed. When the bubo is in the groin, and at the upper part of the thigh, we may conclude that the lymphatics, both from the penis and thigh, run to the affected gland. When the bubo is high up, or on the lower part of the belly, before Poupart's ligament, probably the abſorbents, which ariſe from about the groin, lower part of the belly and pubes, paſs through the bubo. When the bubo is far forward, the abſorbents of the penis and ſkin about the pubes paſs through the ſwelling. Mr. Hunter contends, that the knowledge of theſe circumſtances is very neceſſary, in order to apply mercury in the moſt advantageous ſituations.

The utility of rubbing the mercury into ſurfaces, the abſorbents of which lead through the bubo, muſt be obvious, when it is conſidered, that the medicine cannot paſs to the common circulation without going through the diſeaſed parts; that it muſt promote the cure, as it paſſes through them; and that it alſo prevents the matter, which has already paſſed, and is ſtill continuing to paſs into the conſtitution, from acting there. Thus the bubo is cured, and the conſtitution, at the ſame time, preſerved.

Mercury alone, however, is not always capable of effecting the cure of buboes.

When the inflammation riſes very high, bleeding, purging, and fomenting, are generally recommended. When the inflammation was eryſipelatous, Mr. Hunter had a high opinion of bark; and when it was ſcrofulous, he uſed to recommend hemlock, and poultices made with ſea-water.

The ſame eminent writer alſo takes notice of the fact of emetics ſometimes occaſioning the abſorption of buboes, even after they contain matter.

1. *Reſolution of the Inflammation of the Abſorbents on the Penis.*—Though there is not ſurface enough beyond the bubo, for rubbing-in a ſufficient quantity of mercury, to prevent the effects of abſorption, Mr. Hunter ſtill adviſes this ſurface to be kept conſtantly covered with mercurial ointment. In conſequence of the ſurface in queſtion being ſo ſmall, more mercury muſt alſo be conveyed into the ſyſtem by the mouth, or frictions on ſome other part. Mr. Hunter obſerves, that this is neceſſary, both in order to prevent a lues venerea, and to cure the parts themſelves. The quantity of mercury muſt be regulated by the appearances of the original complaint, and the readineſs with which the diſeaſe gives way. The ſame method, he adds, is to be followed in women, and the ointment ſhould be kept continually applied to the inſide and outſide of the labia.

2. *Reſolution of Buboes in the Groin.*—The inflammation of the abſorbent glands is to be treated on the ſame principle as that of the veſſels. In the firſt caſe, however, we are able to make a larger quantity of mercury paſs through the diſeaſed parts. When the bubo is in the groin, the mercurial ointment is to be rubbed on the thigh. This ſurface, as Mr. Hunter remarks, will in general abſorb as much mercury as will be ſufficient to reſolve the bubo, and preſerve the conſtitution from being contaminated; but when reſolution does not readily take place, the ſame author adviſes us to increaſe the ſurface of friction, by rubbing the ointment upon the leg.

When the bubo is on the lower part of the belly, the ointment ſhould be rubbed alſo on the penis, ſcrotum, and belly. The ſame plan ſhould be followed when the bubo is ſtill more forward.

Mr. Hunter ſtates, that when the bubo gives way, the mercurial frictions muſt be continued, till it has entirely ſubſided, and, perhaps, longer, on account of the chancre, which may not yield ſo ſoon as the bubo. After the bubo has ſuppurated, Mr. Hunter is doubtful, whether rubbing-in mercury is uſeful, or not.

3. *Reſolution of Buboes in Women.*—When the ſwellings are ſituated between the labia and thigh, Mr. Hunter recommends the mercurial ointment to be rubbed-in all about the anus and buttock, from which parts the abſorbents probably run through the ſeat of the diſeaſes. When the buboes are in the round ligaments, the ſurface for abſorption will not be large enough, and more mercury muſt be internally given, or rubbed into other ſurfaces.

When the bubo is in one of the inguinal glands, the ſame plan is to be adopted as in the ſame caſe in men.

4. *Buboes in unuſual Situations.*—When buboes form in the arm, or arm-pit, in conſequence of the abſorption of venereal matter from wounds on the hands, or fingers, mercurial ointment ſhould be rubbed on the arm and fore-arm. Mr. Hunter adds, however, that this ſurface may not be ſufficient, ſo that it may be proper to convey more mercury into the ſyſtem in other ways. He ſtates, that he has ſeen a true venereal chancre on the middle of the lower lip, attended with a bubo, on each ſide of the neck, under the lower jaw, cloſe to the maxillary gland. The ſwellings were reſolved by applying mercurial ointment to them, and the chin and lower lip.

5. *Quantity of Mercury neceſſary for the Reſolution of a Bubo.*—Mr. Hunter obſerves, that the quantity of mercury neceſſary for the reſolution of a bubo, muſt be proportioned to the obſtinacy of the complaint; but that care muſt be taken not to extend the employment of the medicine ſo far as to produce certain effects on the conſtitution. When the bubo is in a ſituation which admits of a large quantity of mercury being rubbed in, ſo as to paſs through the ſwelling, and when the complaint readily yields to the uſe of half a dram of mercurial ointment every night, the mouth not becoming ſore, or at moſt only tender, the above author thinks it ſufficient to purſue this courſe, till the gland is reduced to its natural ſize. In this manner, the conſtitution will probably be ſafe, provided the chancre, which may have cauſed the bubo, heals at the ſame time. When the mouth is not affected in ſix or eight days, and the gland does not readily reſolve, then two ſcruples, or a dram, may be applied every night; and, continues Mr. Hunter, if there ſhould ſtill be no amendment, even more muſt be rubbed in. In ſhort (ſays he) if the reduction is obſtinate, the mercury muſt be puſhed as far as can be done without a ſalivation.

When there is a bubo on each ſide, ſo much mercury cannot be made to paſs through each, as the conſtitution in general will not bear this method. However, Mr. Hunter ſanctions the plan of minding the ſoreneſs of the mouth leſs in this kind of caſe; though, he adds, that it is better to let the buboes proceed to ſuppuration, than to load the ſyſtem with too much mercury.

When the ſituation of buboes will not allow an adequate quantity of abſorbed mercury to paſs through them, the frictions muſt be continued in order to affect the conſtitution; but, according to Mr. Hunter, more mercury in this caſe will be requiſite, than when the remedy can be made to paſs directly through the diſeaſed gland.

Many buboes remain ſwollen, without either coming to reſolution, or ſuppuration; and, notwithſtanding every attempt to promote theſe changes, the glands become hard and ſcirrhous. Mr. Hunter conceived, that caſes of this ſort are either ſcrofulous at firſt, or become ſo as ſoon as the venereal diſpoſition is removed. He adviſes the uſe of hemlock, ſea-water poultices, and ſea-bathing.

6. *Treatment of Buboes which ſuppurate.*—The ſuppuration of buboes frequently cannot be prevented by any known means. They are then to be treated, in ſome reſpects, like any other abſceſs. Before opening buboes, Mr. Hunter conceived it was advantageous to let the ſkin become as thin as poſſible, as a large opening would then become unneceſſary, and no meaſures would be requiſite for keeping the ſkin from cloſing, before the bottom of the ſore had healed.

Mr. Hunter thinks it doubtful, whether the application of mercury ſhould be continued through the whole ſuppuration. He was inclined to continue it; but in a ſmaller quantity.

There has been much diſpute, whether a bubo ſhould be opened, or allowed to burſt of itſelf, and whether the opening ſhould be made with a cutting inſtrument, or cauſtic. On this ſubject, Mr. Hunter remarks, that there is no peculiarity in a venereal abſceſs to make one practice more eligible than another. The ſurgeon, he ſays, ſhould in ſome degree be guided by the patient. Some patients are afraid of cauſtics; others, of cutting inſtruments. But when the ſurgeon has the choice, Mr. Hunter expreſſes a preference to opening the bubo with a lancet, in which method no ſkin is loſt. But, he obſerves, that when a bubo is very large, and there will be a great deal of looſe ſkin, after the diſcharge of the matter, he thinks that cauſtic may, perhaps, be better, as it will deſtroy ſome of the redundant ſkin, and occaſion leſs inflammation than what is cauſed by an inciſion. The kali purum, with the calx viva, is the cauſtic commonly employed.

After the bubo has been opened, ſurgeons uſually poultice it as long as the diſcharge and inflammation are conſiderable, and then they employ dreſſings, which muſt be of ſuch a quality, as numerous undeſcribable circumſtances may indicate. The uſe of mercury, in the mean while, is to be continued, both to make the bubo heal, and prevent the bad effects which might otherwiſe ariſe from the matter continually abſorbed. The mercury ſhould alſo be ſo rubbed in, as to paſs, if poſſible, through the diſeaſed groin.

The mercurial courſe is to be purſued till the ſore is no longer venereal. But, in general, ſince this point is difficult to aſcertain, the mercury muſt be given till the part has healed, and even ſomewhat longer, when the bubo has healed very quickly; for the conſtitution is afterwards very apt to become contaminated.

However, mercury is not to be continued thus long in all caſes; for, as Mr. Hunter explains, buboes often aſſume, beſides the venereal, other diſpoſitions, which mercury cannot cure; but will even exaſperate.

Conſequences of Buboes.—Sometimes the ſores, when they are loſing, or entirely deprived of the venereal diſpoſition, become changed into ulcers of another kind, and, moſt probably, of various kinds. How far it is a diſeaſe ariſing from a venereal taint, and the effects of a mercurial courſe jointly, ſays Mr. Hunter, is not certain. This writer ſuſpected, however, that the nature of the part, or conſtitution, had a principal ſhare in the malady.

Mr. Hunter obſerves, that ſuch diſeaſes make the cure of the venereal affection much more uncertain, becauſe, when the ſore becomes ſtationary, or the mercury begins to diſagree, we are ready to ſuſpect that the virus is gone; but this is not always the caſe. Perhaps the action of the venereal poiſon is only ſuſpended, and will commence again as ſoon as the other diſeaſe ceaſes.

In theſe caſes, Mr. Hunter recommends attacking the predominant diſeaſe; but he allows there is difficulty in aſcertaining its nature, and finding out whether it is venereal, or not.

The ſame author alſo acquaints us, that he has ſeen ſome buboes exceedingly painful and tender to almoſt every thing that touched them, and the more mild the dreſſings were, the more painful the parts became.

In ſome inſtances, the ſkin only ſeems to become diſeaſed. The ulceration ſpreads to the ſurrounding integuments, while a new ſkin forms in the centre, and keeps pace with the ulceration, ſo that an irregular ſore, which Mr. Hunter compares with a worm-eaten groove, is formed all round. It appears only to have the power of contaminating the parts which have not yet been affected; and thoſe which have readily healed.

When buboes become ſtationary, and ſeem little inclined to ſpread, attended with a ſinus or two, hemlock, joined with bark, is, according to Mr. Hunter, the medicine moſt frequently ſerviceable. It is beſt to uſe it both externally and internally. The ſame author alſo ſpeaks favourably of ſarſaparilla, ſea-bathing, and ſea-water poultices. He ſtates, that at the Lock Hoſpital, gold-refiners' water has been found a uſeful application; that, in ſome caſes, drinking large quantities of orange-juice, and in others taking mezereon, have been found ſerviceable.

Treatment of ſecondary Symptoms.—Before treating of this ſubject, it may be as well to recapitulate a few of the leading points in Mr. Hunter's doctrine.

1. Syphilitic matter, after being abſorbed into the ſyſtem, circulates with the blood, and is thrown out by the common emunctories; but in its progreſs it may contaminate other parts of the body, and give them a diſpoſition to diſeaſe.

2. When this diſpoſition is given, the diſeaſed action does not follow till a certain time, which varies according to the conſtitution and other circumſtances; but never happens while the conſtitution is under a mercurial irritation.

3. When the diſpoſition has taken place, the action may be ſuſpended by mercury; but the diſpoſition will remain, and the action ſhew itſelf at ſome period after the mercurial irritation has ceaſed.

4. When the action has begun in an order of parts it may be cured, and will not return in the part, or that order of parts from the ſame ſtock of infection.

5. But the diſeaſed action may take place in another order of parts, if that other order has been contaminated; and, in this order, it muſt be treated as in the former.

6. When the diſeaſed action has taken place and been cured in the part firſt infected, in the throat and fauces, the ſkin, and the bones or perioſteum, the ſubject may be ſaid to be free from the diſeaſe, as far as our knowledge has hitherto traced it.

7. The uſual time of the ſkin or fauces taking on the diſeaſed action is, on a medium, ſix weeks after the mercurial irritation that cured the firſt ſymptoms has ſubdivided; and in the bones about twice that time.

8. Whatever doubtful appearances may ariſe on the ſkin, throat, or bones, during the mercurial irritation, under which chancres, or buboes are giving way, they are certainly not venereal: and even if ſuch ſecondary ſymptoms appear after that mercurial irritation has ceaſed, but earlier than the period ſpecified in the preceding propoſition, they are to be regarded with doubt.

9. If no ſecondary ſymptoms appear for three months after the mercurial irritation has ceaſed, and the conſtitution has not in the mean time been occupied by any other diſeaſe, we have for the moſt part no reaſon to apprehend any thing in the ſkin or throat from that ſtock of infection.

Laſtly, there are uncommon inſtances, in which the ſecondary ſymptoms occur ſooner or later than the periods above ſtated. See Hunter's Treatiſe, and Adams on Morbid Poiſons, p. 159, 160.

The treatment of ſecondary ſymptoms conſiſts almoſt entirely of the judicious employment of mercury. Frictions with the ointment are generally the moſt preferable; but ſometimes the pill hydrarg. oxydi rubri, the ſolution of the oxymuriate, or the adminiſtration of mercury by fumigation (ſee FUMIGATION), may be proper and advantageous. The continuance of the mercurial courſe muſt always be ſuſpended, when the effects produced are attended with too much violence or diſorder. Opium may be given to leſſen and check the diarrhœa, which ſometimes ariſes from mercury, and both weakens the patient and diminiſhes the ſpecific action of that mineral on the diſtemper. Sometimes other medicines will be uſeful, either given after the mercury is done with, while it is omitted for a time, or even in conjunction with it. This may be ſaid of bark, cicuta, opium, ſarſaparilla, and the diet-drinks already ſpecified. Whatever doubts may prevail reſpecting the antivenereal qualities of nitric acid, none remain with regard to its utility in meliorating the ſtate of many complaints, which may exiſt after the ſyphilitic action has been entirely ſubdued by a previous exhibition of mercury. But in our general obſervations we have already been ſo full in our directions for the management of a mercurial courſe, and in our account of the effects of other medicines in caſes of ſyphilis, that it would be the moſt ſuperfluous prolixity to enlarge on this ſubject.

There is one queſtion, however, that preſents itſelf as deſerving conſideration, namely, how long a mercurial courſe ought to be continued? We find that it was one of Mr. Hunter's opinions, that when venereal matter is abſorbed, it may produce in parts a diſpoſition to the diſeaſe, or, in other words, a ſtate of contamination, which, though it might have been hindered by the timely effects of mercury, and may now be kept from going into action as long as the ſyſtem is under the influence of mercury, yet cannot be cured, but muſt ſome time or another proceed to action, or a ſtate of palpable diſeaſe. In this condition alone it is curable. We obſerve, however, that Mr. Hunter, in his practice, is not altogether regulated by this principle; for in his directions for the cure of a chancre, he recommends mercury to be followed up ſome time after the ſore is cured, which medicine being ſuppoſed not to be capable of curing the diſpoſition that may be formed, (and if formed at all, muſt have formed ere this,) the method, according to reaſon, can be of no ſervice. We cannot pretend to deliver an opinion whether the practice is poſitively right or the theory wrong. One thing or the other muſt be the caſe. But it is our duty to ſtate that the generality of ſurgeons think it prudent to go on with mercury a certain time after ordinary chancres are healed. But in the treatment of ſecondary ſymptoms we believe the perſeverance in mercury, after all palpable ſyphilitic miſchief is removed, is utterly wrong and unneceſſary. In other reſpects, the mercurial courſe for the relief of ſecondary ſymptoms is to be conducted exactly in the ſame manner as in caſes of chancre or bubo, and according to the directions given in our general obſervations. Should the ſecondary ſymptoms in the throat, ſkin, mouth, or noſe, have taken place and been cured by mercury, we may aſſure the patient that whatever appearances may now preſent themſelves in theſe parts, the complaints cannot be really ſyphilitic. Therefore the continuance of mercury is not indicated. But though we may venture to predict that the diſeaſe will not recur in this firſt order of parts, we cannot promiſe as much with reſpect to the ſecond order, *viz.* the bones, perioſteum, and tendons. Whether theſe have contracted the diſpoſition, or, in other words, are contaminated or not, can never be known *à priori.* If they have contracted the diſpoſition, this cannot be cured by mercury, but will, ſome time or other, take on the ſyphilitic action, or, in other terms, fall into a ſtate of obvious and palpable diſeaſe. It is only in this laſt condition that mercury can exert its beneficial power in effecting a permanent cure. Were this medicine given under the idea of preventing ſyphilitic miſchief, it might indeed delay the coming on of the complaints, but after the diſpoſition has been formed, they muſt ſooner or later follow. Mercury was ſuppoſed by Hunter to be ſometimes capable of preventing the diſpoſition from being formed at all, if exhibited in an early ſtage of a chancre, before the virus has been abſorbed. But as much abſorption, and the conſequent diſpoſition for the diſeaſe in certain parts take place at an early period of the caſe, all perſeverance in mercury for the prevention of any more ſecondary ſymptoms is, according to the Hunterian tenets, altogether fruitleſs. If the ſoft parts or firſt order have been cured, we cannot conſider our patient ſafe, reſpecting the bones, perioſteum, and tendons, or ſecond order, till a medium of at leaſt ſix weeks after the laſt mercurial irritation has ceaſed. Of this the patient ſhould always be warned. The affections of this ſecond order of parts generally conſiſt of nodes and pains. But it is not every ſwelling or pain in a ſuſpected bone that is really venereal. Mercury itſelf will ſometimes bring on painful affections and enlargements of the bones. Even when nodes are ſyphilitic, it often happens—that no continuance nor quantity of mercury will totally remove the ſwelling. Such medicine is only to be continued till we have reaſon to infer all ſyphilitic action in the part is ſubdued, Whatever degree of thickening or enlargement may now remain is only of a common nature, does not demand mercury, and frequently admits of being materially leſſened, or even entirely removed, by bliſters, if care is taken to keep up a diſcharge from the excoriated ſurface with the ſavine cerate.

Some other caſes, connected with the ſubject of lues venerea, will be conſidered in the articles PHIMOSIS and PARAPHIMOSIS. See alſo GLEET, GONORRHŒA, &c.

LUESIA, in *Geography*, a town of Spain, in the province of Aragon; 20 miles S.W. of Jaca.

LUFF, a ſea-term, the ſame with *loof.*

LUFFA, in *Botany*, the Arabic name of an herb of the Cucumber family, *Momordica Luffa*, Linn. Sp. Pl. 1433. Veſling. Ægypt. 48. t. 50, 51. Cavanilles, in his *Icones*, v. 1. 7. t. 9, 10, has applied it generically to a plant called by him *Luffa fœtida*, a native of the Eaſt Indies, with which he thinks it probable that the above *Momordica* may agree in generic characters. Willdenow has adopted this *Luffa*, in his Sp. Pl. v. 4. 383. How far the difference in its ſtamens, whoſe anthers are all ſeparate, and which are accompanied by five abortive filaments, may ſerve to keep it diſtinct, we very much doubt. As to the fruit, it appears nearly to agree with *Momordica Operculata.*

LUG, in *Agriculture*, a long meaſure of land, the ſame with pole or perch, ſixteen feet and a half. In Glouceſterſhire, it however ſignifies a land-meaſure, of ſix yards, or a rod, pole, or perch of ſix yards. It is a meaſure by which ditching and other ſimilar operations are performed in that diſtrict. This term is likewiſe applied to the ſtick by which the work is meaſured. It is ſometimes called *log.*

LUG-*a-Leaf*, a name uſed in ſome parts of England for the *rhomboides* of Rondeletius, and the *rhombus non aculeatus ſquamoſus* of Willughby.

We have it on our own ſhores; and the Corniſh people, who frequently catch it, call it the *lug-a-leaf.* See PLEURONECTES *Plateſſa.*

LUG-*ſail*, in *Sea Language*, is a ſquare ſail, hoiſted occaſionally on the maſt of a boat or ſmall veſſel, upon a yard which hangs nearly at a right angle with the maſt. Theſe are chiefly uſed in the *barca longas*, navigated by the Spaniards in the Mediterranean.

LUGA, in *Geography*, a town of Ruſſia, in the government of Peterſburgh, on a river of the ſame name; 80 miles S. of Peterſburg. N. lat. 58° 25′. E. long. 29° 30′.

LUGANO, or LAURS, a territory of Italy, ceded to the Swiſs cantons in 1513; it is environed by the diſtricts of

Mendris Lugarus, Bellinzona, and the duchy of Milan; it is fertile and populous, about eight leagues long and five broad, lying in N. lat. 46°, and is divided into quarters, containing 106 market towns and villages, and 53,000 inhabitants. This territory produces paſture, corn, fruit, and ſilk; olives are in great abundance. It is now ceded to Italy.—Alſo, the capital of the fore-mentioned bailiwic or diſtrict, which is a ſmall, tolerably built, trading town, delightfully ſituated round the curve of a bay, and backed by a ſucceſſion of hills, riſing in gentle ſwells to a conſiderable height; in front a bold mountain clothed with foreſt projects into the lake, of which a noble branch extends to its right and left. To that ſpot boats of various ſizes are continually paſſing and repaſſing, its baſe being perforated with *cantine*, or caverns, to which the inhabitants ſend their meat, and all ſorts of proviſion, where it is kept untainted for ſeven or eight days, and the wine preſerved with delicious coolneſs. The heats are moderated by the ſurrounding hills, and the cool breezes from the lake. It is no leſs ſheltered from the Alpine blaſts, which, chilled by the neighbouring ſnows, would otherwiſe deſtroy the temperature of this equal climate. Olive, almond, and all the ſouthern fruits ripen here to perfection. Lugano is the emporium of the greater part of the merchandiſe which paſſes from Italy over the St. Gothard, or the Bernardin. At the end of autumn, the Swiſs mountaineers bring down numerous herds of cattle for ſale, and return with leſs bulky commodities. The town contains about 8000 inhabitants; moſt of the houſes are built of tuf-ſtone; the reſidence of the capitano, or governor, is a low building; and on the walls are the arms of the twelve regent cantons. On an eminence above the town ſtands the principal church, remarkable only for the beautiful carvings in ſtone round the doors and roſe-window, and for the delicious proſpect from its towers. In the cloiſter of the Recollets is a capital picture attributed to Luvino; their church is handſome, and the ſkreen is ornamented with the paintings of the Paſſion by the ſame maſter. The palace of the Marquis de Riva contains a few good pictures; 16 miles N.W. of Como. N. lat. 45° 50′. E. long. 8° 53′. Coxe's Switzerland, vol. iii.

LUGANO, *Lake of*, a lake adjoining to the town above deſcribed, about 25 miles in length, and from two to four in breadth; its form is irregular, and bending into continued ſinuoſities. From Porto, a ſmall village, ſituated at its ſouthern extremity, an arm of the lake bends northward, and diſcharges itſelf into the Lago Maggiore, by means of the river Triſa. It is ſcarcely poſſible, ſays Mr. Coxe, to imagine a more perfect or greater variety of beauties than this noble piece of water affords. The vaſt overhanging woods, the bold precipices, the tranſparency of the water, unite to form a ſcenery in the higheſt degree luxuriant. This lake is about 190 feet perpendicular higher than the lake of Como and Lago Maggiore. The two laſt mentioned lakes are of the ſame level, and about 240 feet higher than the city of Milan. Coxe. See LAKE.

LUGARBEN, a town of Pruſſia, in Natangen; 36 miles S.E. of Konigſberg.

LUGAR-NUEVO, a town of Spain, in Valencia, on the coaſt; eight miles S. of Alicant.

LUGDE, or LUDE, a town of Weſtphalia, in the biſhopric of Paderborn, on the Emmer; 24 miles N.N.E. of Paderborn. N. lat. 51° 55′. E. long. 9° 18′.

LUGDUNUM, in *Ancient Geography*. See LYONS.

LUGDUNUM *Batavorum*. See LEYDEN.

LUGGS, the Engliſh name for a peculiar ſpecies of inſect, found in great plenty on the ſhores of Cornwall. It is of the nature of the *ſcolopendra*, and is called by Mr. Ray *vermis ſcolopendroides*. It grows to twelve inches long, and has inſtead of legs nineteen pair of ſtiff briſtles, all which ſtand toward the head part of the creature. The tail is at leaſt five inches long when full grown, and has no mark of them. Its body is rounded, and much reſembles the body of the common earthworm, and is of a fleſh-colour, or pale red. It has no forceps.

LUGMON, in *Natural Hiſtory*, a name given by the people of the Philippine iſlands to a ſpecies of turtle, the female of which has a tuft of red feathers, of a pale blood colour, on her breaſt, which have greatly the appearance of a wound, ſo much that any body would really be deceived.

LUGNAQUILLA, in *Geography*, mountains of Ireland, in the county of Wicklow.

LUGNY, a town of France, in the department of the Saone and Loire, and chief place of a canton, in the diſtrict of Mâcon; 10 miles N. of Mâcon. The place contains 1133, and the canton 12,776 inhabitants, on a territory of 172½ kiliometres, in 19 communes.

LUGO, JOHN DE, in *Biography*, a learned Spaniſh Jeſuit and cardinal, was born at Madrid in 1583. He gave early proofs of his attachment to the introductory parts of learning, and was ſent to ſtudy the law at Salamanca, where he entered the ſociety of Jeſuits, thereby following the example of his brother, though contrary entirely to the wiſh of his father. Upon the death of the father, the two ſons divided a very large eſtate that had fallen to them among the Jeſuits of Seville and Salamanca. He became profeſſor of philoſophy at Medina del Campo, then profeſſor of divinity at Valladolid, and afterwards he filled the divinity chair at Rome. In 1643 he was raiſed to the dignity of cardinal by pope Urban VIII. without his knowledge, and he died at the age of ſeventy-ſeven, in the year 1660. He was the author of ſeven folio volumes, chiefly in theology and morals, of which a few tracts only have any degree of merit, ſuch as "De Virtute et Sacramento Penitentiæ," and "De Juſtitia et Jure." He is, however, particularly celebrated as being the perſon who brought the virtues of bark into notice, which he introduced into France in the year 1650, and which, under the name of "Cardinal Lugo's powder," he adminiſtered gratis to the poor, but obliged the rich to purchaſe with its weight in gold. Bayle.

LUGO, *Lucus Auguſti*, in *Geography*, a very ancient town of Spain, in the province of Galicia, which, in the time of the Romans, was the centre of one of thoſe juriſdictions that were named "Conventus." At preſent it is the ſee of a biſhop, ſuffragan to St. Jago, and worth 1550*l.* ſterling. It is ſituated on an eminence near the banks of the Minho, 13 leagues from its ſource. Here ſeveral councils have been held; and among others, one in 564 to regulate the limits of the biſhoprics of Galicia and Portugal. It is at moſt three miles in circumference: and the ſtreets are tolerably handſome and well paved. It has 12 ſquares, three fountains, and five gates. The walls are ancient, but in good repair. The city contains a cathedral, ſeveral churches and convents, the biſhop's palace, a college, a hoſpital, and an aſylum. The civil adminiſtration is compoſed of an alcalde major, a regidor, and ſeveral diſtrict alcaldes. The cathedral is a very ancient building of Gothic architecture, with a modern portal. Lugo is ſuppoſed to contain more than 4600 inhabitants. They work up wools in this town, but not enough to ſend any out of the country. In its territory is a number of thermal ſprings, temperate and boiling. Wheat, barley, rye, and maize, are produced in the environs; and many large flocks of ſheep are to be ſeen. The Minho ſupplies trout, ſalmon, and lampries. Lugo is diſtant from St. Jago 13 leagues. N. lat. 43° 2′. W. long. 7° 32′.—Alſo, a town of Italy, in the Veroneſe; eight miles N. of Verona. —Alſo, a town of Italy, in the Paduan; 10 miles E. of Padua.—Alſo, a town of Italy, in the department of the Lower Po; 15 miles S. of Ferrara.

LUGOS, a town of Hungary; 37 miles S.W. of Coloſvar.—Alſo, a town of Hungary, in the bannat of Temeſvar, on the Temes; 23 miles E. of Temeſvar.

LUGUBRE, *Fr.* in *Muſic,* a term which implies gloomy, melancholy, dejected.

LUHANGO, in *Geography,* a town of Sweden, in the province of Tavaſtland; 60 miles N.N.E. of Tavaſtland.

LÜHEA, in *Botany,* ſo named by Willdenow, in compliment, as we preſume, to F. K. Freyherr von der Lühe, who publiſhed at Vienna, in 1797, a German hymn to Flora. His poetry ought to be very fine, as we hope it is, to merit ſo magnificent a plant.—Willd. Sp. Pl. v. 4. 1434.—Claſs and order, *Polyadelphia Polyandria.* Nat. Ord. *Columniferæ,* Linn. *Malvaceæ,* Juſſ.

Gen. Ch. *Cal.* Perianth inferior, double; the *outer* of nine equal, linear leaves, channelled at the back; *inner* in five deep, lanceolate ſegments, internally ſmooth, naked, and coloured. *Cor.* Petals five, longer than the calyx, broad, roundiſh, wavy, crenate, veiny. Nectaries five, ſtalked, pencil-ſhaped, hairy. *Stam.* Filaments numerous, hairy, united into five ſets at their baſe; anthers incumbent, roundiſh, ſmooth. *Piſt.* Germen roundiſh, or conical, with five angles, hairy; ſtyle columnar, thick, ſhorter than the ſtamens, ſmooth upwards; ſtigma orbicular, broad, depreſſed, with ſeveral radiant furrows. *Peric.* Capſule of five cells. *Seeds* winged.

Eſſ. Ch. Calyx double; the outer of nine leaves; inner in five deep ſegments. Petals five. Nectaries five, pencil-ſhaped. Style one. Capſule of five cells. Seeds winged.

1. L. *ſpecioſa.* Willd. Nov. Act. Soc. Nat. Scrut. Berol. v. 3. 410. t. 5.—Native of lofty mountains in the Caraccas, from whence we have a ſpecimen, gathered by Dr. J. Mœrter, to whom, though we do not meet with his name, the Vienna gardens are indebted for many of the fineſt plants publiſhed by Jacquin. From him we learn what is mentioned above reſpecting the capſule and ſeeds, about which Profeſſor Willdenow had no information. We have had no opportunity of conſulting his original account in the memoirs of the Berlin ſociety, which is here cited on his own authority in his *Species Plantarum.*

This, the only known ſpecies, is a *tree,* 20 or 30 feet high, with alternate, round, brown *branches,* downy when young. *Leaves* alternate, on ſhort, thick, downy *ſtalks,* roundiſh-oblong, pointed, ſlightly heart-ſhaped and a little unequal at the baſe, three or four inches long, unequally and ſharply ſerrated; ſmooth and naked above; white with denſe ſtellated down, furniſhed with three prominent ribs, and numerous tranſverſe parallel veins, beneath. *Flowers* white, large and handſome, not many together, in downy, terminal, ſimple cluſters. The *calyx* and partial *ſtalks* are clothed with denſe pubeſcence, of a ruſty hue in the dried ſpecimen.—This plant is cloſely allied in habit and fruit to the *Pteroſpermum* of Schreber and Willdenow (*Pentapetes ſuberifolia* and *acerifolia* of Linnæus); the differences in their flowers however ſeem eſſential, eſpecially as the calyx of *Pteroſpermum* is ſimple.

LUHYNY, in *Geography,* a town of Ruſſian Poland; 24 miles W.S.W. of Owrucza.

LUICHEN, a city of China, in Quang-tong, ſituated in a fertile and pleaſant country, near the ſea. N. lat. 28° 58′. E. long. 110° 8′.

LUIDA, in *Botany,* Adanſon v. 2. 492, was ſo called by that writer after Mr. Edward Llwyd, the correſpondent of Ray, who is mentioned in his *Synopſis* as the diſcoverer of ſeveral moſſes and other plants in Wales. This ſuppoſed genus however will neither immortalize him, nor its whimſical author, being made up of various ſpecies of *Hypnum, Bryum, Splachnum,* &c. characteriſed by having ſome leaves triangular and ſome orbicular! Mr. Llwyd appears, by what Ray ſays of him, in the preface to the ſecond edition of his *Synopſis* and elſewhere, to deſerve more permanent commemoration.

LUIGI Rossi, in *Biography,* one of the earlieſt and moſt voluminous compoſers of cantatas in the ſeventeenth century. He is celebrated in 1640 by Pietro della Valle, in his letter to Guidiccioni, for his grave canzonette, particularly that which begins "Or che la notte del ſilenzio amica."

Many of his cantatas are preſerved in all the collections which include the muſic of the laſt century, particularly in the Brit. Muſ. Bibl. Harl. 1265 and 1273, and in Dr. Aldrich's Collection, Chriſt-church, Oxon.

His cantata, "La Fortuna," in the Muſeum collection, No. 1265, is of an immeaſurable length. The recitative, however, with formal cloſes, has pleaſing expreſſions in it, that ſtill live. No *da capo,* or ſign of reference, appears in his cantata, and he writes twice or three times over the ſame airs; a trouble which theſe expedients would have ſpared. He ſeems to have ſtarted ſeveral flimſy diviſions, which afterwards became common; and, indeed, it appears from his cantatas, that as ſoon as ſecular muſic had diveſted itſelf of the pedantry of perpetual canons, fugues, and multiplied parts, another vice crept into the art, by the frequent and exceſſive uſe of diviſions. Luigi, in ſongs for a ſingle voice, has ſome of this kind as long as thoſe in modern bravura airs.

In the Magliabecchi library at Florence, we found a ſcene of oratorio called "Giuſeppe Figlio di Giacobbe, opera ſpirituale fatta in muſica da Aloigi de Roſſi, Napolitano, in Roma." And under the name of *Roſſi* many of his compoſitions may be found in the muſeum.

Luigi, in his motets that are preſerved in the Chriſt-church collection, appears to have been as able to write *à cappella,* in many parts with learning, as with elegance in few.

LUIGNA, in *Geography,* a town of Spain, in Aſturias; 20 miles N.W. of Oviedo.

LUI-LUNG-TA. See Sechoo.

LUING, or Long Island, one of the ſmaller weſtern iſlands of Scotland, between Scarba and Kerrera.

LUINI, Bonetto, of Breſcia, in *Biography,* an opera ſinger in ſoprano, who had been in Ruſſia and other foreign countries, and acquired great wealth, but diſſipated great part of it by play. Yet, after loſing ten thouſand pounds in one night of the money which he had gained *con la ſua virtù,* he was ſtill ſaid, in Italy, to be very rich.

LUIS, St., in *Geography,* a town of South America, in the government of Buenos Ayres, and province of Cordova; 170 miles S.W. of Cordova. S. lat. 32° 10′. W. long. 67° 12′.—Alſo, a town of South America, in the province of Moyes; 72 miles N.W. of Trinidad.—Alſo, a miſſion of Spaniſh monks in New Albion; 10 miles N.E. of Punta el Eſteros.—Alſo, a town of New Navarre; 90 miles S. of Caſa Grande.

Luis *de la Paz, St.,* a town of Mexico, in the province of Mechoacan; 100 miles N. of Mechoacan. N. lat. 21° 50′. W. long. 102° 16′.

Luis *de Maranon, St.* See *St.* Felipe.

Luis *de Potoſi, St.*, a city of Mexico, in the province of Guaſteca, pleaſantly ſituated, and environed with rich gold mines. The town is handſome and well built, conſiderable in ſize, and populous. The ſtreets are ſtraight and neat, the churches magnificent; and the inhabitants, who are chiefly Indians, poſſeſſing all the conveniencies and comforts of life; 190 miles N.N.W. of Mexico. N. lat. 22° 25′. W. long. 103° 6′.

Luis *de Zacatecas*, a town of Mexico, capital of the province of Zacatecas, the ſee of a biſhop, and reſidence of a governor; 240 miles N.N.W. of Mexico. N. lat. 22° 50′. W. long. 103° 46′.

LUI-SHIN, in *Mythology*, the Jupiter of the Chineſe, or ſpirit that preſides over thunder. The figure of it has the wings, beak, and talons of an eagle. In his right hand he holds a mallet, to ſtrike the kettle-drums with which he is ſurrounded, whoſe noiſe is intended to convey the idea of thunder; while his left is filled with a volume of undulating lines, very much reſembling thoſe in the hands of ſome of the Grecian Jupiters, and evidently meant to convey the ſame idea, *viz.* that of the thunder-bolts, and lightning.

LUISIANA, in *Geography*, a diſtrict of Spain, in Andaluſia, three leagues from Ecija, ſettled in 1791 by a colony of Germans, who built houſes in an uniform plan, allotting to each houſe a portion of land, which conſtituted a village; but the houſes are already beginning to fall into ruin.

LUISINUS, Louis, in *Biography*, a phyſician, was born at Udina, in the ſtate of Venice, where he obtained conſiderable reputation about the middle of the ſixteenth century, and was not leſs diſtinguiſhed by his acquiſitions in literature, than by his medical ſkill. He was author of the following works: "Aphoriſmi Hippocratis hexametro carmine conſcripti," Venice, 1552; "De compeſcendis animi affectibus per moralem philoſophiam et medendi artem, Tractatus in tres Libros diviſus," Baſle, 1562; "Aphrodiſiacus, ſive de Lue Venerea, in duos Tomos bipartitus, continens omnia quæcumque hactenus de hac re ſunt ab omnibus Medicis conſcripta," Venice, 1566, folio. The firſt volume contained an account of the printed treatiſes on the lues up to that year; the ſecond, publiſhed the year following, comprehended principally the manuſcript works on the ſubject, which had not then been committed to the preſs. Eloy Dict. Hiſt. de la Médecine.

LUISNANSBERG, in *Geography*, a town of Sweden, in Weſtmanland; 48 miles N.W. of Stroemſholm.

LUJULA, in *Botany*, &c. See Oxalis *Acetoſella*.

LUK, in *Geography*, a town of Bohemia, in the circle of Saatz; 6 miles E. of Carlſbad.

LUKAU, a town of Moravia, in the circle of Znaym; eight miles W.N.W. of Znaym.

LUKAWETZ, a town of Bohemia, in the circle of Czaſlau; 28 miles S.W. of Czaſlau.

LUKE, St., in *Sacred Biography*, one of the evangeliſts, and the writer of the goſpel bearing his name, and alſo of the book of the Acts of the Apoſtles. Concerning his profeſſion and country, previouſly to his converſion to Chriſtianity, there is a difference of opinion among both ancient and modern authors. The firſt mention of him in the books of the New Teſtament occurs in his own hiſtory. (Acts, xvi. 10, 11.) When the apoſtle Paul was again, a ſecond time, in Greece, it appears, from Acts, xx. 1—6, that St. Luke was with him; and that he acccompanied Paul from Greece through Macedonia to Philippi, and went with him from thence to Troas. It further appears from the ſequel of the hiſtory in the Acts, that he accompanied the apoſtle to Jeruſalem, and remained with him there. When the apoſtle was ſent a priſoner from Cæſarea to Rome, Luke was in the ſame ſhip with him, and ſtaid with him at Rome during the whole interval of his two years' impriſonment in that city. Of this fact we have alſo collateral evidence from the epiſtles of St. Paul written at this time. (2 Tim. iv. 11. Philem. v. 24.) And if Luke the beloved phyſician, mentioned Col. iv. 14, be the evangeliſt, this paſſage affords additional proof of his being then with the apoſtle. Some have alſo ſuppoſed that he is the perſon mentioned 2 Cor. viii. 18, as "the brother, whoſe praiſe is in the goſpel throughout all the churches." Dr. Lardner, with his uſual induſtry and accuracy, has collected the teſtimonies of various ancient writers concerning the evangeliſt Luke; and from theſe he deduces ſeveral inferences that ſerve to ſettle his profeſſion and country, and to correct the miſtakes of other authors. The notion which ſome have entertained, that he was a painter, is without foundation, as it is not countenanced by ancient writers. The learned Grotius and J. Wetſtein have ſuggeſted, that he was a Syrian and a ſlave, either at Rome, or in Greece; and that having obtained his freedom, he returned to his native place, Antioch; where he became a Jewiſh proſelyte, and then a Chriſtian. This opinion is alſo rejected by our author; who obſerves, that the account given of this evangeliſt by Euſebius, and by Jerom after him, that he was a Syrian, and a native of Antioch, is not ſupported by the authority of Irenæus, Clement of Alexandria, Tertullian, or Origen, nor indeed by any other writer before Euſebius. Cave and Mill have intimated, that Luke was converted by Paul at Antioch; but it is alleged, on the other hand, that if Luke had been a Gentile, converted by Paul, he would have been always uncircumciſed, and unfit to be the companion of Paul. For the apoſtle would not have allowed the Greeks or Gentiles of Antioch, or any other place, to ſubmit to that rite. Beſides, no hints occur in the Acts, or in the epiſtle of St. Paul, that Luke was his convert. It has been doubted by ſeveral learned men, whether the evangeliſt Luke was a phyſician. Dr. Lardner allows, that the diſtinguiſhing character of "beloved phyſician" (Col. iv. 14.) has occaſioned a difficulty, which, however, he thinks, is not inſuperable; and he conceives it probable, that Luke the evangeliſt was by profeſſion a phyſician. That St. Luke was a Jew by birth, or at leaſt by religion, our author argues from his being a conſtant companion of Paul in many places, particularly at Jeruſalem. If he had been an uncircumciſed Gentile, ſome exceptions would have been made to him, which we do not find from St. Paul's epiſtles, or the Acts, to have been the caſe; and beſides, he follows the Jewiſh computations of times, ſuch as the paſſover, the pentecoſt, and the faſt. (See Acts, xii. 3. xx. 6. 16. xxvii. 9.) In this opinion, that St. Luke was a Jew, many learned and judicious moderns, as Mr. L. Baſnage and J. A. Fabricius, concur; and Dr. Lardner thinks, that it ought not to be queſtioned. Moreover, he was probably an early Jewiſh believer, ſoon after Chriſt's aſcenſion, if not a hearer of Chriſt, and one of the 70 diſciples. The moſt ancient writers ſpeak of Luke as a diſciple of the apoſtles. Some have reckoned him one of the Seventy, others have thought him to be Lucius, mentioned by St. Paul in the epiſtle to the Romans, and others have ſuppoſed, that he was one of the two diſciples that met Jeſus in the way to Emmaus. If Lucius be the evangeliſt Luke, which is an opinion adopted by ſeveral learned writers, we may conclude, that he was a Jew, and related to the apoſtle. We may know his character, and, in part, his hiſtory, from Acts, xi. 19—21, and xiii. 1—4. He was an early Jewiſh believer after Chriſt's aſcenſion, and together with others was very ſerviceable in preaching the goſpel, at an early period, to Jews and Gentiles out of Judea. And if the other diſciple, who accompanied Cleopas in the way to Emmaus, be Luke the evangeliſt, he was a diſciple and eye-witneſs of Jeſus Chriſt; though we do not allow him to be one of the 70. It appears further, that St. Luke was for a conſiderable time a conſtant companion of St. Paul; and that he was alſo acquainted with other apoſtles. It is probable, that St. Luke died a natural death; becauſe none of the moſt ancient writers, ſuch as Clement of Alexandria, Irenæus, Origen, Euſebius, and Jerom, ſay any thing of his martyrdom. Gaudentius, biſhop of Breſcia, about the year 387, obſerves, that in his time it was generally ſaid, that Luke and Andrew finiſhed their courſe at Patræ in Achaia, but without adding that it was by martyrdom: and if St. Luke be called a martyr, the appellation may be underſtood in a general ſenſe, as equivalent to confeſſor, or a great ſufferer for the goſpel. Cave ſays (Hiſt. Lit. p. 25.) that Luke lived a ſingle life, and died in the 84th year of his age, about the year of Chriſt 70, but of what death is uncertain. Philoſtorgius informs us, that in the reign of the emperor Conſtantius, the reliques of St. Luke were tranſlated from Achaia to Conſtantinople; and therefore it muſt have been a general perſuaſion in thoſe times, that St. Luke had died, and had been buried in Achaia, which, Gregory Nazianzen ſays, was the province aſſigned to St. Luke. Lardner.

Luke's *Goſpel, St.*, in *Biblical Hiſtory*, the goſpel written by the evangeliſt Luke. That the goſpel and the Acts were written by St. Luke, is a fact that is confirmed by the teſtimony of the moſt unexceptionable of ancient writers. To this purpoſe we may obſerve, that this goſpel is often cited by Juſtin Martyr, who lived A.D. 140, and by the martyrs of Lyons, A.D. 177. Irenæus, A.D. 178, ſays expreſsly, that Luke, the companion of Paul, put down in a book the goſpel preached by him. Clement of Alexandria, A.D. 194, has borne ample teſtimony to this goſpel, as well as the Acts. Tertullian, A.D. 200, aſſerts againſt Marcion the genuineneſs and integrity of the copies of St. Luke's goſpel, owned by himſelf and Chriſtians in general, and for this he appeals to divers apoſtolical churches. Luke's digeſt, ſays this ancient father, is often aſcribed to Paul; it being eaſy to take that for the maſter's which the diſciples publiſhed. Origen, A.D. 230, mentions the goſpels according to the order in which they are now generally received; and "the third," he ſays, "is that according to Luke, the goſpel commended by Paul, publiſhed for the ſake of the Gentile converts." Euſebius of Cæſarea, A.D. 315, ſpeaking of St. Paul's fellow-labourers, ſays, "and Luke, who was of Antioch, and by profeſſion a phyſician, for the moſt part a companion of Paul, who had likewiſe a more than ſlight acquaintance with the reſt of the apoſtles, has left us in two books, divinely inſpired, evidence of the art of healing ſouls, which he had learned from them. One of theſe is the goſpel, which he profeſſeth to have written, as they delivered it to him, "who from the beginning were eye-witneſſes and miniſters of the word," with all whom he ſays likewiſe, he has been perfectly acquainted from the very firſt. The other is the Acts of the Apoſtles, which he compoſed now, "not from what he had received by the report of others, but from what he had ſeen with his own eyes." In the Synopſis, aſcribed to Athanaſius, but ſuppoſed to be written about the end of the fifth century, it is ſaid, "that the goſpel of Luke was dictated by the apoſtle Paul, and written and publiſhed by the bleſſed apoſtle and phyſician Luke." But it is needleſs in this place to cite a greater number of authorities.

As to the time in which this goſpel was written, it may be ſettled without much difficulty. The Acts of the apoſtles were publiſhed A.D. 63 or 64, and not long after the goſpel, as is generally allowed. Accordingly Dr. Mill ſuppoſes, thoſe books to have been two parts of one and the ſame volume, and to have been publiſhed in the year of Chriſt 64. The goſpel itſelf bears internal characters of the time in which it was written. As to the place where it was written, learned writers have differed. Jerom ſays, that Luke, the third evangeliſt, publiſhed his goſpel in the countries of Achaia and Bœotia. Gregory Nazianzen alſo ſays, that Luke wrote for the Greeks, or in Achaia. Grotius ſays, that about the time when Paul left Rome, Luke departed to Achaia, and there wrote his books, which we have. Cave thought that they were written at Rome, and before the termination of Paul's captivity. But it is ſaid by Mill, Grabe, and Wetſtein, that Luke publiſhed his goſpel at Alexandria in Egypt. Dr. Lardner has particularly examined theſe different opinions; and he concludes, that "upon the whole, there appears not any good reaſon to ſay, that St. Luke wrote his goſpel at Alexandria, or that he preached at all in Egypt. It is more probable, that when he left Paul, he went into Greece, and there compoſed, or finiſhed, and publiſhed his goſpel, and the Acts of the apoſtles." Origen was of opinion that this goſpel was written for gentile converts; Jerom ſays, that of all the evangeliſts Luke was beſt ſkilled in the Greek language, and that he wrote his goſpel more eſpecially for gentiles, but Chryſoſtom maintains that he wrote for all in general. Luke himſelf, at the beginning of his goſpel, aſſigns the reaſon of his writing, declaring, that whereas many others had raſhly undertaken to give a relation of the matters which he moſt ſurely believed, he thought himſelf obliged, in order the better to divert us from the uncertain relations of others, to deliver in his goſpel a certain account of thoſe things, which he was well aſſured of from his intimate acquaintance and familiarity with Paul, and his converſation with the other apoſtles. So ſays Euſebius.

St. Luke has inſcribed his two books, his goſpel, and the Acts to Theophilus, by whom ſome underſtand any good Chriſtian in general, others a particular perſon. Auguſtin, Chryſoſtom, and many others, have underſtood Theophilus to be a real perſon. Cave ſuppoſed him to be a nobleman of Antioch; but it ſeems more probable, that if St. Luke publiſhed his books in Greece, as we have already ſtated, Theophilus, to whom they are addreſſed, was a man of the ſame country. It is of greater importance to aſcertain, who are deſignated by the many mentioned by the evangeliſt, who before him had attempted to write hiſtories of Jeſus Chriſt. Epiphanius ſuppoſes, that St. Luke here refers to Cerinthus, Merinthus, and others of that deſcription. Origen and Jerom ſay, that many attempted to write goſpels, as Baſilides, Apelles, and others; and they mention ſeveral ſuch, not received by the church; ſuch as the goſpel of Thomas and Matthias, the goſpel of the Egyptians and of the Twelve. Theophylact ſeems to imagine, that the evangeliſt referred to the two latter goſpels now named. Grabe, while he allows that St. Luke did not refer to the goſpels of Baſilides or Thomas, or ſome others mentioned by Origen, for they were not publiſhed till after St. Luke's death, thinks, that St. Luke might refer to the goſpels according to the Egyptians, and according to the twelve, and ſome others. But againſt this opinion it might be urged, that the goſpel according to the Egyptians was not compoſed before the ſecond century. Dr. Mill is of opinion, that of the many narrations to which St. Luke refers, the two principal were the goſpels according to the

Hebrews, and according to the Egyptians. About the year 58, or ſomewhat ſooner, ſays Mill, were compoſed, by ſome of the faithful, evangelical narrations, or ſhort hiſtories of Chriſt. The writers were not our evangeliſts Matthew and Mark; but ſome of the firſt Chriſtians, who, before Luke, and alſo before Matthew and Mark, wrote hiſtories of the things done by Chriſt, and received from apoſtolical tradition, not with a bad or heretical deſign, but with the ſame deſign with our evangeliſts; but their hiſtories, as we may infer from St. Luke's account, were inaccurate and imperfect, and they contained ſome things not certain, or well atteſted, and poſſibly ſome miſtakes. Dr. Lardner, who upon the whole approves the preceding ſtatement, cannot allow the goſpel according to the twelve, or according to the Hebrews, to have been one of the memoirs or narrations to which St. Luke refers; for theſe were ſhort hiſtories, whereas that was a full goſpel, ſuppoſed to have been either St. Matthew's original Hebrew goſpel with additions, or his original Greek goſpel, tranſlated into Hebrew with additions. Moreover, the goſpel according to the Egyptians could not have been one of theſe memoirs, becauſe it was an heretical goſpel, probably compoſed in the ſecond century by ſome Encratites, who were enemies of marriage. Whatever the memoirs or narrations were, none of them now remain, nor even ſo much as any fragments, nor quotations of them occurring in any Chriſtian writings now extant. Marcion, a heretic who lived in the firſt half of the ſecond century, rejected all the goſpels, except that of St. Luke, and this he mutilated and altered, and interpolated in a great variety of places. He would not allow it to be called the goſpel of St. Luke, eraſing the name of that evangeliſt from the beginning of his copy. Some of his followers conſidered it as written partly by Chriſt himſelf, and partly by the apoſtle Paul. Marcion retrenched the firſt and ſecond chapters entirely, and begun his goſpel at the firſt verſe of the third chapter, and even read this in a manner different from our copies, *viz.* In the 15th year of Tiberius Cæſar, God deſcended into Capernaum, a city of Galilee. Some late Chriſtian writers have concurred in Marcion's retrenchment; but without ſufficient authority. Lardner.

St. Luke, ſays a modern writer, is pure, copious, and flowing in his language, and has a wonderful and entertaining variety of ſelect circumſtances in his narration of our Saviour's divine actions. He acquaints us with numerous paſſages of the evangelical hiſtory, not related by any other evangeliſt: both in this goſpel and Apoſtolical Acts, he is accurate and neat, clear and flowing, with a natural and eaſy grace; his ſtyle is admirably accommodated to the deſign of hiſtory; it had a very conſiderable reſemblance to that of his great maſter St. Paul; and, like him, he had a learned and liberal education, and appears to have been very converſant with the beſt claſſics; for many of his words and expreſſions are exactly parallel to theirs. Blackwall's Sacred Claſſics.

Luke's *Day, St.*, is a feſtival obſerved on the 18th of October.

Luke's *Hoſpital, St.* See Hospital.

Luke's *Keys*, in *Geography*, two ſmall iſlands near the coaſt of Honduras. N. lat. 15° 50'. W. long. 86° 35'.

LUKIN, a town of Poland, in Volhynia; 56 miles N. of Zytomiers.

LUKINJA, a town of Samogitia; 24 miles N. of Miedniki.

LUKOIENOV, a town of Ruſſia, in the government of Niznei-Novgorod; 80 miles S. of Niznei-Novgorod. N. lat. 54° 58'. E. long. 54° 20'.

LUKOMLA, a town of Ruſſia, in the government of Polotſk; 60 miles S.S.E. of Polotſk.

LUKOW, a town of Poland, in the palatinate of Lublin; 40 miles N. of Lublin.

LUKOWA, a town of Poland, in the palatinate of Belcz; 44 miles W.S.W. of Belcz.

LUKOWO, a town of Lithuania, in the palatinate of Brzeſc; 80 miles E. of Pinſk.

LULANIS, in *Botany*, a name given by ſome of the ancient Greeks to a plant, uſed very frequently for a yellow colour in dyeing, and by the ladies for tinging their hair yellow, the favourite colour of thoſe times. Neophytus explaining this word, ſays, that it ſignified the ſame with iſatis, glaſtum, or woad; and ſeveral others have been of that opinion, though very abſurdly, ſince the glaſtum or woad dies a blue colour, not a yellow; and by no means anſwers the deſcription of the lulanis, which is the ſame with the lutum, or lutea herba of the Romans, and with the geniſtella tinctoria, or dyers'-weed of theſe times.

LULEA, or Lula, in *Geography*, a ſea-port of Sweden, in Weſt Bothnia, on the N. ſide of the river Lulea, at the N.W. extremity of the gulf of Bothnia, with a good harbour; 68 miles W. of Tornea. N. lat. 65° 38'. E. long. 22° 4'.

LULES, Los, a town of South America, in the province of Tucuman; 50 miles N. of St. Miguel de Tucuman.

LULLI, John Baptist de, in *Biography*, ſecretary to Louis XIV., and ſuperintendant of his muſic, was born at Florence in 1633, having a miller for his ſire. A Cordelier gave him his firſt leſſons in muſic upon the guitar, though he afterwards applied to the violin. He was only thirteen when the Chevalier de Guiſe, being on his travels in Italy, propoſed to his parents to take him into France, and engage Mademoiſelle de Guiſe, his ſiſter, to take him among the officers of her kitchen.

This princeſs having accidentally heard him play on the violin, had him taught, and he became in a ſhort time an excellent performer.

Louis XIV. being deſirous to hear him, was ſo pleaſed with his performance, that in 1652, he appointed him inſpector-general of his violins, and ſoon after created a new band, which was called *les petits violons*. Theſe new muſicians formed by Lulli ſoon became the firſt in Europe, which is not ſaying much for them, as ſuch was the ignorance of the generality of inſtrumental performers at this time, that they could execute nothing which they did not know by heart.

The genius, therefore, of Lulli was obliged to contract itſelf to the abilities of his orcheſtra, and it is ſuppoſed that he would have written as well as his ſucceſſors, if he had lived a hundred years later.

Before the eſtabliſhment of the opera in France, the king every year gave to his court magnificent ſpectacles called *ballets*, in which there was a great number of ſymphonies, mixed with recitatives. Lulli firſt began by only compoſing the muſic to the dances in theſe ballets; but the king became ſo fond of his compoſitions, that he would hear no other.

In 1672, Perrin, to whom the patent for an opera was firſt granted, reſigned it to Lulli, whoſe genius began to expand, and he may be regarded as the creator of this kind of muſic, which (according to M. Laborde) has not been ſo much improved (in France, he ſhould have ſaid) as ſome imagine, and in many particulars has, perhaps, loſt more than it has gained.

It is true, that he was aſſiſted by the immortal Quinault, of whom he had the penetration to diſcover the genius, and the dexterity to ſecure the aſſiſtance by a deed, in which the poet engaged to ſupply him every year with a new drama, for 4000 livres, about 200*l*.

Quinault ſketched many plans, and carried them to the king for his approbation: after which Lulli pointed out to him the places where the dances were to be introduced, and let him hear the airs. The ſcenes were examined, by his majeſty's command, in the Academie des Belles Lettres. Thus by their united opinions, all the dramas of Quinault were regulated, which remain the beſt that were produced in France during the 17th century, and will probably continue the beſt, if new ſet, for many ages yet to come. The enemies of Quinault, jealous of his glory and talents, contrived to bring about a quarrel between the poet and muſician. Lulli had recourſe to La Fontaine, who, at his requeſt, produced the opera of "Daphne," but as ſoon as Lulli had heard it read, he did not conceal from the author, that he thought his talents did not extend to writing operas. La Fontaine, piqued at having laboured in vain, to revenge himſelf on Lulli, for his coarſe rejection of his drama, wrote his comedy, or rather ſatire, of "The Florentine," but as he had a good heart, he ſoon ſubdued his wrath, and they were ſincerely reconciled.

The king, more and more pleaſed with his muſic, conferred on him the title and emoluments of ſecretary to his majeſty, and heaped upon him many other favours for his family.

The king having been extremely ill in 1686, Lulli compoſed a Te Deum on his recovery, which was executed in the church of the Feuillans, Rue Saint Honoré, the eighth of January 1687. In enthuſiaſtically regulating the time with his cane, he ſtruck his foot ſo violently, that, probably from a bad habit of body, a mortification came on. He was at firſt adviſed to have the toe taken off which was wounded by the cane, then the foot, and then the leg. But ſome quacks having promiſed to cure him without amputation, Meſſrs. de Vendôme, who had a ſincere regard for him, offered to the quacks 2000 piſtoles if they cured him, and lodged them in the hands of a banker. But all their efforts were uſeleſs, and it was announced to him that he muſt prepare for death. His confeſſor refuſed to give him abſolution, but upon condition that he would burn the opera of Achilles and Polixene, which he had been preparing for the ſtage. He conſented, and the compoſition was committed to the flames.

Some days after, fancying himſelf a little better as the gangrene encreaſed, one of the young princes of Vendôme came to ſee him; "What! Baptiſt, (ſays he,) haſt thou been ſo fooliſh as to burn ſuch good muſic."—"Huſh, huſh! my lord, (whiſpers Lulli,) I have got a copy of it." However, it is aſſerted, that he manifeſted in his laſt moments a ſincere repentance, and teſtified the higheſt ſenſe of religion. He died at Paris on the 22d of March 1687, in the 54th year of his age. He was buried in the church of Les petits Péres, in La Place des Victoires, where a fine monument was erected to his memory, and where may have been read, before the revolution, the following epitaph by Santeuil:

"Perfida mors, inimica audax, temeraria et excors,
Crudeliſque, et cœca probris te abſolvimus iſtis,
Non de te querimur, tua ſint hæc munia magna.
Sed quando per te populi Regiſque voluptas,
Non ante auditis rapuit qui cantibus orbem
LULLIUS eripitur, querimur modo, ſurdus fuiſti."

Lulli was a fortunate man to arrive in a country where muſic had been ſo little cultivated, that he never had any rival, nor was there throughout the whole kingdom of France an individual who had the courage to doubt of his infallibility in his art. He was fortunate in ſo magnificent a patron, and ſtill more fortunate in a Lyric poet, who could intereſt an audience by all the powers of poetry, by the contexture of his fables, and variety and force of his characters.

Lulli was rough, rude, and coarſe in his manners, but without malice. His greateſt frailties were the love of wine and money. There were found in his coffer 630,000 livres in gold, an exorbitant ſum for the time in which he lived. He had the art of making himſelf at once beloved and feared by the performers of his muſic, which is doubtleſs the moſt eſſential talent for governing ſuch eccentric and mutinous ſubjects; but however difficult it may be to keep them in order and in good humour, true merit, exact juſtice, and a ſteady conduct always ſucceed.

Lulli married the only daughter of Michel Lambert, the celebrated muſician, and the beſt ſinging-maſter of his time. By this marriage he had three ſons and three daughters, to all of whom he left an ample proviſion, and friends in power, who conferred on them places, penſions, and kindneſs.

LULLY, RAYMOND, a philoſopher and chemiſt of great note in the dark ages, was born in the iſland of Majorca in 1236, of an illuſtrious family of that name at Barcelona. From the works that bear his name, it is ſuppoſed that he was ardently attached to the ſtudy of the ſciences, of philoſophy, theology, chemiſtry, and medicine; but there is great doubt as to the genuineneſs of many of thoſe works, which were probably written by his pupils, or even by perſons who lived conſiderably poſterior to his time. In his youth he bore arms, and led the life of a man of pleaſure. It is related of him that he fell in love with a young damſel, named Eleonora, who obſtinately rejected his addreſſes; and, at length, when he was one day ſtrongly preſſing his ſuit, and demanding the reaſon of her refuſal, ſhe expoſed her breaſt conſumed with a cancerous ulcer. This ſpectacle is ſaid to have inſpired him with a reſolution of ſeeking a remedy for her diſeaſe, and to have been the motive which led him to the chemical ſtudies, for which he became celebrated, as well as to a journey into Africa, for the purpoſe of conſulting the works of Geber. But others affirm that the ſight had ſuch an effect upon him, that he plunged into religious retirement, and devoted the reſt of his days to pious purpoſes. It appears certain that he undertook a courſe of travels into Africa and the Eaſt, with the view of converting the Mahometans to the Chriſtian faith, where he incurred greath hardſhips and dangers, and whence he was permitted to depart only upon condition of not returning. He was ſtill, however, ſo much inflamed with zeal for this object, that he entered the Franciſcan order, and again viſited Africa. When he was again found there, he was thrown into priſon, and after ſuffering much torture, was releaſed through the interceſſion of ſome Genoeſe merchants, who took him on board their ſhip; but he died on the paſſage when juſt in ſight of his native land, in 1315. Others aſſert that he was ſtoned to death while preaching to the infidels in Africa, on the 26th of March of that year.

From this narrative, which repreſents Lully in the light of a fanatic miſſionary, we ſhould not expect that ſcientific character which has cauſed his name to be preſerved to modern times. It ſeems, however, that he had travelled in England, France, and Germany; and he calls himſelf a diſciple of Roger Bacon, whom he had probably ſeen in his journey. As a chemiſt, indeed, he appears in an extraordinary light; for although he is believed to have been the firſt who mentioned the philoſopher's ſtone, and though that was the leading object of his reſearches, together with the fancied *panacea*, or univerſal remedy; yet he maintained that chemiſtry was only to be acquired, and theſe objects to be obtained by a ſeries of experiments; and that the art was not to be taught by words. Boerhaave ſays of the chemical works extant in Lully's name, that he has peruſed moſt of them, and finds them beyond all expectation excellent; ſo that he has been tempted to doubt whether they could be the work of that age. "So full," ſays he, "are they of the experiments and obſervations which occur in later writers, that either they muſt be ſuppoſititious, or the ancient chemiſts muſt have been acquainted with many things which paſs for modern diſcoveries."

Lully has alſo been celebrated as a ſcholaſtic metaphyſician. He introduced into the ſchools a "new tranſcendant art," which was diſtinguiſhed by his name, and by means of which a perſon might hold a diſputation for a whole day, upon any ſubject whatever, without underſtanding any thing of the matter. This invention ſuited the genius of the age. It conſiſted in collecting a number of general terms, common to all the ſciences, of which an alphabetical table was to be provided. Subjects and predicates taken from theſe were to be reſpectively inſcribed in angular ſpaces upon circular papers. The eſſences, qualities, affections, and relations of things being thus mechanically brought together, the circular papers of ſubjects were fixed in a frame, and thoſe of predicates were ſo placed upon them as to move freely, and in their revolutions to produce various combinations of ſubjects and predicates, whence would ariſe definitions, axioms, and propoſitions, varying infinitely. This contrivance, worthy of Laputa, was greatly admired in its time, and its author acquired the title of *the moſt enlightened doctor*.

The following are the titles of thoſe of his works which relate to chemiſtry: "De Secretis Naturæ, ſeu de Quinta Eſſentia, Libellus," firſt printed in 1518, 4to. and frequently republiſhed; "Apertorium de veri Lapidis compoſitione," 1546; "Teſtamentum duobus Libris univerſam Artem Chemicam complectens. Item ejuſdem Compendium animæ tranſmutationis Artis metallorum," 1566; "Liber Mercuriorum;" "De Arte brevi;" "Secreta Secretorum;" "Codicillus, ſeu Vade Mecum, in quo fontes Alchymicæ Artis et Philoſophicæ reconditioris uberrimè traduntur." Many manuſcript eſſays of Lully are preſerved in the library at Leyden, and upwards of a hundred, it is ſaid, which have never been publiſhed, in that of Venice. A complete edition of all the writings attributed to this author was publiſhed at Mayence in 1714, including treatiſes on theology, morals, medicine, chemiſtry, phyſics, law, &c. Gen. Biog. Eloy Dict. Hiſt.

LULLY'S *Art*. See ART, and the preceding article.

LULOLA, in *Geography*, a ſtrong town in Angola, ſituated on an iſland about 100 miles from the mouth of the Coanza, fortified by the Portugueſe.

LULWORTH, EAST, a pariſh in the hundred of Winfrith, in Blandford diviſion of Dorſetſhire, England, is ſituated ſix miles from Wareham, and 116 from London, and contains 74 houſes and 364 inhabitants. The chief object worthy of notice here is Lulworth caſtle, the ſeat of —— Weld, eſq. It is ſituated in the ſouth-eaſt corner of an extenſive park, which occupies a circuit of nearly four miles and a half, and has been lately ſurrounded by an excellent ſtone wall, upwards of eight feet high. The preſent edifice, which was built on or near the ſcite of a caſtle mentioned ſo far back as the year 1146, was commenced in 1588, and finiſhed in 1609, except the internal decorations, which were not completed till after the year 1641, when the anceſtor of the late owner purchaſed the eſtate. The caſtle is an exact cube of eighty feet, with a round tower at each corner thirty feet in diameter, and riſing ſixteen feet above the walls, which, as well as the towers, are embattled. The hall and dining-room are ſpacious, and the rooms in general eighteen feet high. The principal front is on the eaſt, and is faced with Chilmark ſtone, decorated with ſtatuary. In the year 1789, during their majeſties' reſidence at Weymouth, Mr. Weld had ſeveral royal viſits, the particulars of which are recorded in two inſcriptions over the entrance to the caſtle. Mr. Weld has lately erected an elegant little chapel for the convenience of his family; this ſtructure is of a circular form, increaſed by four ſections of a circle, ſo as to form a croſs, and finiſhed with a dome and lantern. The pariſh church of St. Andrew (which was an ancient and curious fabric) has been recently rebuilt at the expence of Mr. Weld.

United with the foregoing pariſh, and about a mile diſtant towards the ſea, is that of Weſt Lulworth, which contains 73 houſes and 312 inhabitants. At a ſmall diſtance is Lulworth Cove, a ſort of natural baſin, into which the ſea flows through a wide gap in the cliff, ſufficient for the entrance of veſſels of 70 or 80 tons burthen. About a mile from the cove is the Arched Rock, which projects from the land into the ſea, having an opening near 20 feet high in the middle, formed like an arch, through which the proſpect of the ſea has a peculiar effect. Beauties of England and Wales, vol. iv.

LUMACHELLE MARBLE. See MARBLE.

LUMAMPA, in *Geography*, a town of South America, in the province of Tucuman; 90 miles S. of St. Yago del Eſtero.

LUMBAGO, in *Medicine*, ſignifies a pain in the loins (*lumbi*), eſpecially from rheumatiſm, affecting the ligaments of the ſpine, or the muſcles of the back. See RHEUMATISM.

The only diſeaſes which are liable to be miſtaken for *lumbago* in general, are painful affections of the kidnies, which, it is well known, are ſeated within the lumbar region on each ſide of the ſpine; eſpecially inflammation of theſe glands, or the formation of calculi in them, or the paſſage of theſe concretions through the ureters towards the bladder. The ſymptoms, attendant upon theſe diſorders of the kidnies, will be found deſcribed in their proper places. (See NEPHRALGIA, NEPHRITIS, and GRAVEL.) We may obſerve here, that, in *lumbago*, the pain does not follow the courſe of the ureters, it is not accompanied with retraction of the teſticle in men, it is not increaſed by external preſſure, it is often little felt, except in the erect poſture, and there is no vomiting, nor any change in the quantity or quality of the urine; the contrary of all which is obſerved in inflammatory and calculous affections of the kidnies.

The internal remedies, commonly adminiſtered for the cure of other forms of rheumatiſm, are alſo beneficial in the lumbago; ſuch as opiates, with antimonials and other ſudorifics, taken at bed-time, and followed by laxatives in the morning, or combined with laxatives, eſpecially the ſubmuriate of mercury, preparations of ſulphur, or ſalts. Much relief, however, is afforded by the application of local ſtimulants to the lumbar region externally. Liniments of camphor, turpentine, and ſimilar ſubſtances, have been found from the experiments of Dr. Home, Dr. Ferriar, and others, among the moſt efficacious of theſe applications. Dr. Ferriar affirms, that he has found a ſolution of camphor in ſulphuric ether relieve the pains of diſeaſed joints, after all other applications had failed ; and he relates ſeveral caſes in which a liniment, reſembling that propoſed by Dr. Home, proved an effectual cure for lumbago. He uſed two drams of camphor, an ounce of baſilicon, and half an ounce of black ſoap, omitting the oil of turpentine, ammonia, and ſeeds of cyminum, preſcribed by Dr. Home. The effect of this application, he ſays, is commonly the removal of the pain within three days, often in a much ſhorter time. See Ferriar. Med. Hiſt. and Reflect. vol. i. p. 188. Home, Clin. Exper. p. 261, § xiv.

LUMBALIS, in *Anatomy*, an epithet applied to ſome parts placed about the loins. The lumbar arteries are branches of the aorta, and the lumbar veins terminate in the inferior vena cava. (See ARTERY and VEIN.) The lumbar nerves are five pairs proceeding from the medulla ſpinalis. (See NERVE.) The lumbar muſcles are the *pſoæ* ; which ſee. For an account of the lumbar vertebræ, ſee SPINE. The lumbar region of the abdomen is the lateral and poſterior part of the umbilical region, the part, in ſhort, which conſtitutes the loins in common language. See ABDOMEN.

LUMBAR, in *Geography*, a town of Spain, in Navarre ; 15 miles N. of Sangueſa.

LUMBAR *Abſceſs*, in *Surgery*. See PSOAS *Abſceſs*.

LUMBERTON, in *Geography*, a poſt-town of America, in North Carolina, and capital of Robeſon county, on Drowning creek ; 32 miles S. of Fayetteville ; it has a court-houſe, and about 36 dwelling-houſes.

LUMBI, in *Anatomy*. See LOINS.

LUMBO, in *Geography*, a town of Benguela ; 120 miles E.N.E. of Benguela. S. lat. 11° 45′.

LUMBORUM QUADRATUS, in *Anatomy*, iléo-coſtien of Dumas, a muſcle ſituated towards the ſide and lower part of the vertebral column, and extending from the criſta of the os innominatum, and the ileo-lumbar ligament, to the lower edge of the laſt falſe rib, and to the tranſverſe proceſſes of the four firſt vertebræ of the loins. It has the form of an elongated ſquare, but is rather broader below than above. Its anterior ſurface is covered above by the diaphragm, then by the anterior lamina of the aponeuroſis of the tranſverſus abdominis, and towards the inſide by the pſoas. It correſponds to the kidney and to the colon. Its poſterior ſurface is covered by the middle aponeuroſis of the tranſverſus, which ſeparates it from the common maſs of the ſacro-lumbalis and longiſſimus dorſi. The outer edge is inclined a little from above downwards, and from within outwards, and correſponds to the angle formed by the ſeparation of the anterior poſterior laminæ of the aponeuroſis of the tranſverſus abdominis. The inner margin is attached to the points of the tranſverſe proceſſes of the four firſt lumbar vertebræ by as many flattened pieces. The lower edge is attached to the middle of the poſterior part of the criſta ilii, for an extent of about two inches ; it is alſo fixed to the ileo-lumbar ligament. The upper edge is inſerted in the lower margin of the laſt falſe rib, for a more or leſs conſiderable extent in different ſubjects ; in ſome it occupies nearly the whole length, in others only the inner third part.

It is fixed to the criſta of the os innominatum by aponeuroſes, which aſcend to a conſiderable height on the anterior ſurface and the outer edge. Theſe fibres, which proceed from below upwards, are croſſed below by others, which ariſe from the tranſverſe proceſs of the laſt lumbar vertebræ. The fleſhy fibres aſcend rather obliquely from without inwards, and the internal are the ſhorteſt ; they terminate at the tranſverſe proceſſes of the lumbar vertebræ by tendinous fibres. The external and longer ones end at the lower edge of the laſt falſe rib by ſhort aponeuroſes. Sometimes another muſcular ſtratum ariſes from the front of the tranſverſe proceſſes of the third and fourth lumbar vertebræ, paſſes obliquely outwards, and is blended with the reſt of the muſcle.

The quadratus lumborum inclines the loins towards its own ſide ; when theſe are fixed, it may raiſe the pelvis on that ſide, and lower it on the oppoſite. By drawing downwards the laſt falſe rib, it may be concerned in reſpiration.

LUMBRE, in *Geography*, a town of France, in the department of the Straits of Calais, and chief place of a canton, in the diſtrict of St. Omer. The place contains 502, and the canton 13,655 inhabitants, on a territory of 262½ kiliometres, in 36 communes.

LUMBRERAS, a town of Spain, in Leon ; 22 miles N.N.W. of Civdad Rodrigo.

LUMBRICALES, in *Anatomy*, certain ſmall muſcles of the fingers and toes, connected with the flexor tendons of thoſe organs. See FLEXOR.

LUMBRICOIDES. See ASCARIS.

LUMBRICUS, EARTH-WORM, in *Natural Hiſtory*, a genus of the vermes-inteſtina claſs and order. Body round, annulate, with generally an elevated fleſhy belt near the head, moſtly rough, with minute concealed prickles placed longitudinally, and furniſhed with a lateral aperture. There are ſixteen ſpecies contained in this genus, of which four are natives of this country.

Species.

* TERRESTRIS ; Common earth-worm, ſometimes named dew-worm. Body red, with eight rows of prickles. There is another variety exactly like this, only half the ſize. The body contains about one hundred and forty rings, each of which has four pair of prickles, not viſible to the naked eye, but diſcoverable to the touch : when expanded, it is convex on each ſide ; but when contracted, it is flattiſh beneath, with a red canal down the body ; the belt is wrinkled and porous ; mouth placed beneath the proboſcis. It inhabits decayed wood and common ſoil, which, by perforating, it renders fit to receive the rain : it devours the cotyledons of plants, and wanders about by night ; it is the food of moles, hedge-hogs, and various birds.

This worm has neither bones, brains, eyes, nor feet. It has a number of breathing holes ſituated along the back, and near each ring. The heart is placed near the head, and may be obſerved to beat with a very diſtinct motion. The ſmall rings are furniſhed with a ſet of muſcles, that enable it to act in a ſort of ſpiral direction ; and by this means it is capable, in the moſt complete manner, of creeping on the earth, or penetrating into its ſubſtance. Theſe muſcles enable the worm to contract or dilate its body with great force. The rings are each armed with ſmall ſtiff ſharp prickles, which the animal is able to open out or cloſe upon its body ; and from beneath the ſkin there is ſecreted a ſlimy matter, which, by lubricating the body, greatly facilitates its paſſage through the earth.

This worm has been confounded with the ASCARIS *Lumbricoides*, or round worm of the human inteſtines ; which ſee. The difference between the two may be briefly pointed out in this place.

The common earth-worm has its extremities much blunter than thoſe of the inteſtinal ; its mouth conſiſts of a ſmall, longitudinal fiſſure, ſituated on the under ſurface of a ſmall rounded head, there being no appearance of the three veſicles which are found in the aſcaris. On the under-ſurface of the earth-worm there is a large ſemi-lunar fold of ſkin, into which the head retreats ; but this is wanting in the aſcaris. The anus of the earth-worm opens at the very extremity of the tail, and not, as in the aſcaris, at a conſiderable diſtance from it. The aſcaris wants the tranſverſe rugæ, which are ſo ſtrongly marked in the earth-worm, as well as the broad yellowiſh band by which the body of the latter is ſurrounded.

The internal ſtructure of the two worms is alſo extremely different. In the earth-worm there is a complete and large ſtomach, conſiſting of two cavities; and the inteſtinal canal in the latter is larger, and more formed into ſacculi than in the aſcaris. The parts ſubſervient to generation in theſe worms are very different: in the aſcaris there is a diſtinction of ſex, but the common earth-worm is hermaphrodite.

Dew-worms, though a ſmall, and frequently regarded as a deſpicable link in the chain of nature, would, if loſt, be greatly miſſed by thoſe who are apt to conſider them as a nuiſance. For, independently of their affording a large ſupply of food to birds, &c. already noticed, they are of great uſe in promoting vegetation, by boring, perforating, and looſening the ſoil, and rendering it pervious to rain and the fibres of plants, by drawing ſtraws and ſtalks of leaves and twigs into it; and, moſt of all, by throwing up ſuch numbers of lumps called worm-caſts, which act as a fine manure for grain and graſs.

* Marinus; Lug. Back with two rows of briſtly tubercles; body pale red, round, and annulate, with greater or leſs rings; the firſt prominent, with two oppoſite tufts of ſhort briſtles on each, the lower part ſmooth. It is found on the ſhores of England, and other parts of the European coaſt, where it buries itſelf in the ſand to a great depth, leaving a little riſing with an aperture on the ſurface. It is uſed as a bait for fiſhes.

Vermicularis. Body white, with two rows of prickles. It inhabits the wet and decayed trunks of trees, and among moiſt leaves, moving very expeditiouſly in moiſt places, but twiſting itſelf up in dry ones. Its body is poliſhed and glabrous.

Variegatus. Rufous ſpotted, with ſix rows of prickles. It inhabits wet plantations, and is the moſt beautiful of the whole genus. The body red, very finely teſſellate with brown, having a ſanguineous line running down the whole body. It eaſily breaks in pieces, and as eaſily reproduces what has been loſt by accident or otherwiſe.

Tubifex. Body reddiſh, with two rows of prickles; the body is pellucid, very ſimple, thin, and truncate at the tip, with a dark inteſtine. It is found at the bottom of rivulets, where it forms a perpendicular tube of earth for its habitation.

Lineatus. Body white, with a longitudinal red line. Found very abundantly on the ſhores of the Baltic, among ſea-weed. It is pellucid, with rather a ſhort body, having a yellow artery on the back, and a bifid vein towards the head.

Ciliatus. Body rufous, and ciliate between the rings; the body is glabrous, with about forty ſegments; the interſections are armed with four tufts of ſhort briſtles.

Tubicola. White, with a red dorſal ſpot on each of the ſegments. This ſpecies is found in the bays of Norway that have a clayey bottom, in a round membranaceous tube, covered with mud, and about an inch longer than itſelf. It has twenty-five ſegments in the body, of which the interſections are armed with two briſtles on each ſide; the inteſtine is black, and running down the whole body.

Echiurus. Body covered with rows of granulations; the hind-part obtuſely truncate, and ſurrounded with a double crown of briſtles. It inhabits the ſandy bottom of the ſhores of Belgium; is moſt obſervable in winter, and is the chief food of cod-fiſh. Body whitiſh-grey, with fulvous viſcera, about the ſize of a perſon's middle finger; tongue fleſhy, thickiſh, and boat-ſhaped.

* Thalassema. Body ſtriate, dirty red, with ſhining red ſpots, beneath grey; mouth ſurrounded with a funnel-like tube, which is wrinkled within, and plaited at the margin; the body is glabrous, mucous, thicker at one end, and ſomewhat pointed at the other; the mouth is placed above, with a ſaffron funnel. Inhabits the ſhores of Cornwall.

Edulis. Body whitiſh-fleſh-colour, ſubclavate behind, dilated and papillous before; mouth terminal, and ſurrounded with a villous rim or wrinkle. There are two hundred and ſeventy-eight rings between the villous part and the hinder end, ſeparated by an annular ſtria; the hind-part bulbous, with a double papilla; the fore-part beſet with numerous fleſh-coloured ones diſpoſed in tranſverſe rows.

* Oxyurus. Body whitiſh-livid, very ſharp at the hind extremity, and obtuſe before, with a round, retractile, and exſertile proboſcis. This ſpecies is found on the Suſſex coaſt, is about an inch and a half long, and annulate with very fine ſtriæ; ſnout truncate, and very fine, granulate, with a pore at the baſe ſcarcely viſible.

Fragilis. Body red, with lateral divided warts, and faſciculate briſtles. The body of this ſpecies reſembles the terreſtris, with above five hundred ſmooth and very brittle rings; the head is conic, with an approximate wrinkled mouth. It inhabits the muddy bottom of the bays of Norway.

Armiger. Body red, with double lanceolate lamellæ on the belly, and none on the fore-part; is about two inches long, and conſiſting of about two hundred rings. Found in the iſlands of Norway.

Cirratus. Body armed with very long cirri. Inhabits the Norway ſeas.

Sabellaris. Body jointed, and truncate at one end; the interſections of the joints thick, and armed with two prickles. It reſembles the tubicula, and is found in the Norwegian ſeas.

LUMELLA, in the *Glaſs-trade*, the round hole in the floor of the tower of the leer, which is directly over the working ſurface, and by which the flame is let into the tower.

LUMELLO, in *Geography*, a town of Italy, in the department of the Gogna. This place lately gave name to a diſtrict in the duchy of Milan, called "Lumalline," on the Gogna; once the reſidence of the kings of Lombardy, now a village; 26 miles S.W. of Milan. N. lat. 48° 57′. E. long. 8° 47′.

LUMHAGAN, an iſland in the ſtraits of Malacca, near the coaſt of Salengora, 12 miles long, and 5 broad; ſeparated from the continent by a narrow channel, called the "ſtraits of Lumhagan." N. lat. 2° 54′. E. long. 101° 24′.

LUMIJOCKI, a town of Sweden, in Eaſt Bothnia; 12 miles S.W. of Ulea.

LUMINOSA Semita. See Semita.

LUMINOUS Column, and *Fire*. See the ſubſtantives.

Luminous *Emanations*, have been obſerved from human bodies, as alſo from thoſe of brutes. The light ariſing from currying a horſe, or from rubbing a cat's back, are known to moſt. Inſtances of a like kind have been known on combing a woman's head. Bartholin gives us an account, which he entitles "mulier ſplendens," of a lady in Italy, whoſe body would ſhine, whenever ſlightly touched with a piece of linen. Theſe effluvia of animal bodies have many properties in common with thoſe produced in glaſs; ſuch as their being lucid, their ſnapping, and their not being excited without ſome degree of friction; and are undoubtedly electrical, as a cat's back has been found ſtrongly electrical when ſtroaked. See ELECTRICITY and LIGHT.

Human bodies not only appear luminous, but even the exhalations from them adhering to their clothing will cauſe it to ſhine likewiſe.

LUMINOUSNESS *of the Sea*. See LIGHT and SEA.

LUMIO, in *Geography*, a town in the iſland of Corſica; 5 miles N.E. of Calva.

LUMME, in *Ornithology*. See COLYMBUS *Troile*.

LUMO, in *Geography*, a town of the iſland of Cuba; 45 miles S.S.W. of Havannah.

LUMP-FISH, in *Ichthyology*. See CYCLOPTERUS *Lumpus*.

LUMP *of Fleſh*, in the *Manege*. See BOUILLON.

LUMPARAN, in *Geography*, an iſland of Sweden, eaſt of Aland, between the Baltic and the gulf of Bothnia. N. lat. 60° 7′. E. long. 20° 3′.

LUMPEN, in *Ichthyology*, the name of a fiſh, common in the markets at Antwerp, of a long and round body, growing gradually ſlenderer to the tail. Its colour is a greeniſh-yellow, with black broad lines on the back, placed tranſverſely; and it has a little redneſs at the end of its tail.

The lumpen is a ſpecies of the blenni, diſtinguiſhed by Artedi by the name of the *blennius*, with fins like cirri under its neck, and tranſverſe ſtreaks on the back. The cirri are bifid.

LUMPOKOLSKOI, NIZNEI, in *Geography*, a town of Ruſſia, in the government of Tobolſk, on the Oby. N. lat. 61°. E. long. 76° 54′.

LUMPOKOLSKOI, *Verchnei*, a town of Ruſſia, in the government of Tobolſk. N. lat. 60° 54′. E. long. 78° 22′.

LUMPS, in *Rural Economy*, a term made uſe of to ſignify barn-floor bricks, in ſome places.

LUNA, in *Aſtronomy*. See MOON.

LUNA, in *Ancient Geography*, *Lunegiano*, a town ſituated on the Macra, which had a port in Liguria, called "Lunæ Portus," which, according to Strabo, was a very large and fine harbour, containing ſeveral others. The town was ſituated to the weſt of the mouth of the river Macra, and was afterwards called "Cariaram," both names alike ſignifying Luna, the moon, and referring to its form, which was that of a creſcent. Lucan ſpeaks of its aruſpices; Servius and Martial of its cheeſe, marble, and wine. According to Strabo, it was deſtroyed by Nero; and ſome of its ruins are ſtill viſible in a place called Lunigona, and its ſmall territory is named Lunegiano. M. Gebelin conjectures that the name Luna was derived from the Celtic *lun*, water.

LUNA, in *Geography*, a town of Spain, in Arragon; 22 miles W. of Hueſca.—Alſo, a town of Lithuania, in the palatinate of Troki; 16 miles S.E. of Grodno.

LUNA *Cornea*, in *Chemiſtry*, is the combination of marine acid with ſilver, or the white curdy precipitate of muriat of ſilver, which takes place, when the nitrat, acetat, or any other ſoluble ſalt of ſilver comes in contact with muriatic acid, either ſingle or in any ſoluble combination. See SILVER.

To make this combination, the ſilver is firſt diſſolved in nitrous acid; to this ſolution marine acid, or more uſually common ſalt diſſolved in water, is added. The mixture ſoon becomes turbid, and a copious precipitate is formed in it, which has always the appearance of curd. The ſolution of ſalt is added, till no more precipitate is formed. The precipitate, when ſeparated from the liquor that ſwims over it, is called luna cornea; becauſe if this matter be expoſed alone to fire, the acid carries off with it a portion of the ſilver, and the remaining matter melts, aſſuming the form of a horny ſubſtance.

The beſt method of reducing luna cornea, or of ſeparating ſilver from marine acid, according to Margraaf, is to diſſolve half an ounce of fine ſilver in aquafortis, to precipitate it by a ſea-ſalt, and edulcorate the precipitate, which will then weigh five drams ſixteen grains. For the reduction of this precipitate, mix it with an ounce and a half of dry volatile ſal ammoniac, triturate them well together with a little water during a quarter of an hour; then add three ounces of mercury obtained from cinnabar by means of quick-lime, and continue to triturate during ſome hours with a little more water. Thus an amalgam will be formed, which being waſhed from a white powder and dried, will weigh three ounces and half a dram. By diſtillation of this amalgam, a reſiduum of ſilver, four grains leſs than the original half ounce, will be obtained. By ſubliming the white powder, which weighs five drams, three grains of ſilver will be obtained; but if the amalgam and white powder be diſtilled together, the operation will fail, and the luna cornea be recompoſed. (Berlin Mem. 1749.) M. Beaume ſays, that luna cornea may be reduced without loſs by fuſion with four times its weight of fixed alkali.

Luna cornea mixed with ſea-ſalt and tartar rubbed on braſs gives a ſilver-like appearance; and is the ſubſtance employed for the ſilvering of the dial-plates for clocks. A more ſubſtantial ſilvering may be given by the above mixture, if the piece of braſs to be ſilvered be previouſly heated conſiderably, and cleaned with a ſcratch bruſh; and if the operation be repeated, till the ſilver ſeems to be ſufficiently thick. The braſs having a ſtronger diſpoſition to unite with the marine acid than the ſilver has, ſeparates this acid from the ſilver, which is then precipitated upon the ſurface of the braſs plate. The luna cornea will alſo ſerve in examination of mineral waters, or of any other liquor, to diſſolve if they contain marine acid in whatever baſe it be engaged, except metallic baſes; for if theſe waters contain the ſmalleſt quantity of marine acid, a luna cornea will be precipitated by them from a ſolution of ſilver in nitrous acid, and this luna cornea is known by its acid-like appearance. Macquer, Chem. Dict. Engl. edit.

LUNA, *Cryſtals of*. See CRYSTAL.

LUNA, *Vitriol of*. See VITRIOL.

LUNA, in *Ichthyology*. See ZEUS *luna*.

LUNA *Marina*, a name by which Geſner has called a peculiar ſpecies of ſtar-fiſh, called alſo the *ſea-ſun*. See SOLEIL *de Mer*.

LUNA *Piſcis*, a name by which ſome have called the mola, which we uſually call in Engliſh the *ſun-fiſh*. See TETRODON *mola*.

LUNÆ, *Lac*. See LAC *lunæ*.

LUNACHI, in *Geography*, a town of Chili; 42 miles E.N.E. of Valparaiſo.

LUNAGUANA, a town of Peru, in the audience of Lima; 80 miles S.S.E. of Lima.

LUNAHOLM, a ſmall iſland among the Shetlands. N. lat. 60° 44′. W. long. 1° 16′.

LUNALE, BEZOARDICUM. See BEZOARDICUM.

LUNAN BAY, in *Geography*, a bay on the E. coaſt of Scotland, celebrated for its ſecurity againſt all but eaſterly winds; four miles S. of Montroſe. N. lat. 56° 37′. W. long. 4° 27′.

LUNANESS, a cape on the E. coaſt of Shetland. N. lat. 60° 43′. W. long 1° 17′.

LUNAR, ſomething relating to the moon.

LUNAR *Cauſtic.* See CAUSTIC.

LUNAR *Cycle.* See CYCLE.

LUNAR *Dial.* See DIAL.

LUNAR *Eclipſe.* See ECLIPSE.

LUNAR *Horoſcope.* See HOROSCOPE.

LUNAR *Month.* See MONTH.

LUNAR *Obſervations*, or *Lunar Method*, is the method of finding the longitude, by taking the diſtance between the moon and the ſun, or a fixed ſtar, which has been already explained under the article LONGITUDE; but the great importance of this problem induces us here to give a further and more minute explanation of its principles and operations, and of the different methods that have been deviſed for obtaining the ſolution.

This method of finding the longitude is the greateſt modern improvement in navigation: the idea, however, is not modern, but it has not been applied with any ſucceſs until within the laſt fifty years. M. de la Lande mentions certain aſtronomers who, above two hundred years ago, propoſed this method, and contended for the honour of the diſcovery; but its preſent ſtate of improved and univerſal practice he very juſtly aſcribes to Dr. Maſkelyne. The diſcovery, indeed, ſeems to claim leſs honour than its ſubſequent improvements; it is one of thoſe things which are obvious in theory, but difficult in practice. The moſt ancient method of finding the longitude was by the lunar eclipſes; and that of finding it by the lunar diſtances is perfectly analogous: it is therefore highly probable that the method was thought of at a very early period, but the want of proper tables and apparatus prevented its being reduced to practice.

It may be obſerved, that, in the moſt practical methods of finding the longitude at ſea by celeſtial obſervations, the moon is the chief guide or inſtrument; for the quickneſs of her motion renders her peculiarly well adapted for meaſuring ſmall portions of correſpondent time. Now, as ſhe is ſeen in the ſame part of the heavens nearly at the ſame inſtant of abſolute time, from all parts of the earth where ſhe is viſible, and as ſhe is continually and ſenſibly changing her place, it is evident that if two correſpondent obſervers were to note the preciſe moment of their reſpective times, when ſhe is ſeen in any particular part of the heavens, *the difference between thoſe times would ſhew the difference of longitude.*

In every method of finding the longitude by the moon, the firſt object is to be able to aſcertain the part of the heavens where ſhe is: this is eaſily ſeen at the time of her eclipſes, or at the occultation of a fixed ſtar; and theſe were naturally the firſt methods reſorted to, but they occur too ſeldom for general uſe: the moon's place, however, may be marked with equal preciſion, by taking her diſtance from ſome fixed object, whoſe latitude and longitude are known; and ſtars in or near the zodiac are preferred, as the nearer ſuch objects are to the moon's orbit, the greater will be her motion with reſpect to them: and though her motion is not uniform, yet, during the ſhort ſpace of time that ſhe is near any ſtar, ſhe may be conſidered as moving uniformly.

It has been above obſerved, that if two perſons under different meridians were to mark the moon's place, and alſo their relative times of obſervation, they might thence tell their difference of longitude; but they could not communicate their obſervations ſufficiently ſoon for practical purpoſes; and even admitting the poſſibility of this, it were neceſſary that the longitude of one place ſhould be known, in order to determine that of the other. Now the Nautical Almanac is calculated to ſupply all theſe wants. This admirable work may be conſidered a perpetual obſerver, that communicates univerſally and inſtantaneouſly certain celeſtial appearances, as they take place at Greenwich Obſervatory. Here the diſtances are given between the moon and the ſun, and certain remarkable ſtars in or near the zodiac, for every three hours; and any intermediate diſtance, or time, may be thence found by the rule of proportion with ſufficient accuracy. If, therefore, under any meridian, a lunar diſtance be obſerved, *the difference between the time of obſervation and the time in the Almanac, when the ſame diſtance was to take place at Greenwich, will ſhew the longitude.* For example, if the obſerved diſtance between the ſun and moon be 50° at eight o'clock, but by the Almanac the ſame diſtance of 50° will take place at Greenwich at ſix, it is evident that the difference between the obſerved and computed time is two hours, and therefore the longitude is 30°; and it is alſo clear that the longitude is eaſt, the time being moſt advanced at the place of obſervation.

A method ſo apparently ſimple muſt have been long ſince adopted; but two difficulties occured: one the want of proper inſtruments, which want has been happily ſupplied by the invention and ſubſequent improvement of Hadley's quadrant; and the other, correct lunar tables; for the moon, though ſo near and ſo conſpicuous to the earth, has always perplexed aſtronomers more than any other celeſtial body. The various inequalities of her motions were never properly underſtood, until ſir Iſaac Newton diſcovered the phyſical laws which govern them; and from his theory profeſſor Mayer formed lunar tables, which have been found ſufficiently correct for nautical practice, and from which thoſe tables in the Nautical Almanac of the lunar diſtances had been calculated under the direction of Dr. Maſkelyne for many years. In 1806 the French board of longitude publiſhed new lunar tables, calculated by Du Burgh, from the theory of La Place and the obſervations of Dr. Maſkelyne; and from theſe tables the lunar diſtances in the Nautical Almanac of 1813 are computed, and in the Almanacs that follow.

The above two difficulties having been obviated, a third ſeems ſtill to remain; and though this is in ſome meaſure removed by the application of the Nautical Almanac and Requiſite Tables, yet the calculation is ſtill more tedious than might be wiſhed; nor is it poſſible to render it much ſhorter, as the problem neceſſarily comprehends ſolutions in two ſpheric triangles: this ariſes from the circumſtance of the *obſerved diſtances* between the heavenly bodies not being the *true diſtances*; for the altitudes of thoſe bodies are more or leſs affected both by refraction and parallax; and though theſe effects only operate in a vertical direction, yet that which changes the altitude of two bodies muſt alſo change their diſtance aſunder. This is evident from the conſideration, that the altitude of a celeſtial object is an arc of an azimuth circle intercepted between the object and the horizon; and as all azimuth circles incline gradually to each other from the horizon to the zenith, where they meet, it is plain that the more two bodies are apparently raiſed, the leſs will be their apparent diſtance aſunder, and the contrary.

It is well known that the heavenly bodies are raiſed by refraction, and depreſſed by parallax; and that theſe effects are greateſt in the horizon, and gradually diminiſh to the zenith, where they become nothing. Refraction depends upon altitude alone, but parallax depends upon both altitude and diſtance. All celeſtial objects, except the moon, are more affected by refraction than by parallax, and therefore appear above their true places; but the moon is always ſeen, excepting in the zenith, below her true place, being more affected by parallax than refraction, on account of her proximity to the earth.

Theſe effects of parallax and refraction, though counteracting each other, ſeldom do it ſo equally as to render all correction unneceſſary. Sometimes the *apparent* diſtance is nearly a whole degree more or leſs than the *true* diſtance; and the principal cauſe of ſo great a difference is the moon's parallax: for this body, which is the chief guide to the longitude, is alſo the great cauſe of error in the diſtances, and is therefore the principal object of correction.

In making a lunar obſervation, four perſons are generally employed, one of whom takes the diſtance, two the altitudes, and the fourth notes the time. Theſe things ſhould be performed at the ſame inſtant; and if the obſervation be repeated ſeveral times, and a mean taken, the work is likely to be the more correct: and great care is here neceſſary, for an error in this part of the operation, particularly in taking the diſtance, will pervade the ſubſequent parts of the work, and will of courſe produce a wrong ſolution. The manner of adjuſting the inſtruments, and of making the obſervations, is beſt taught by practice. Thoſe who wiſh for written inſtructions on the ſubject are referred to the Britiſh Mariner's Guide by Dr. Maſkelyne, to Dr. Mackay's book upon the longitude, or to profeſſor Vince's Practical Aſtronomy.

Of correcting the Altitudes of the obſerved Objects.—When a lunar obſervation is made, the firſt object is to clear the altitudes from ſemidiameter, dip, refraction, and parallax.

The moon's parallax in altitude muſt be next calculated; by ſaying, *As radius is to the ſine of her zenith diſtance, ſo is the ſine of her horizontal parallax* (as given in the Nautical Almanac) *to the ſine of her parallax in altitude.*

In correcting the moon's altitude, an allowance ſhould be made for the augmentation of her ſemidiameter, which gradually takes place from the horizon to the zenith. This increaſe is given, in the IVth of the Requiſite Tables, for every five degrees of altitude, which correction is to be added to her horizontal ſemidiameter given in the Nautical Almanac.

The augmentation of the moon's ſemidiameter is cauſed by her being nearer to the ſpectator in the zenith than in the horizon by a ſemidiameter of the earth—for the magnitude of a body is in the inverſe ratio of its diſtance from the obſerver; and as the earth's ſemidiameter bears a very ſenſible proportion to the moon's diſtance, ſhe is ſeen under the greateſt angle in the zenith, which angle gradually diminiſhes to the horizon.

There are other corrections of the altitudes which may be neceſſary in caſes of particular nicety, but which are ſeldom noticed at ſea. Theſe are—an allowance for the contraction of the vertical ſemidiameters of the ſun and moon by refraction; a correction of the moon's parallax, ſuppoſing the earth an oblate ſpheroid; a correction for the refraction, according to the actual ſtate of the atmoſphere, as ſhewn by a thermometer and barometer, and not according to the mean aſtronomical refraction which is commonly uſed. Theſe corrections, though perhaps neceſſary towards the perfection of this problem, being very ſmall, and frequently counteracting each other, are generally conſidered of little conſequence in nautical practice, where greater errors are unavoidable.

From the corrected Altitudes to find the true Diſtance.—It is eaſy to conceive, that by a lunar obſervation, the three ſides of a ſpheric triangle are meaſured in the heavens, which ſides are the apparent co-altitudes of the obſerved bodies, and their apparent diſtance aſunder.

The co-altitudes or zenith diſtances being corrected, the queſtion is, to find the true diſtance between the obſerved bodies; but here there are only two things given, and therefore it cannot be performed until the angle at the zenith is known, which is determined from the three given ſides of the triangle, by the rules of ſpheric trigonometry.

As the effects of parallax, refraction, &c. operate only in a vertical direction, it is evident that the corrections of the zenith diſtances or containing ſides will not change the included angle at the zenith; and therefore three things are now known, namely, the corrected zenith diſtances and the included angle, whence the other ſide is determined by ſpherics, and this ſide is the true diſtance ſought.

A General View of the different Methods of working the Lunar Obſervations.—Few problems have been ever more inveſtigated or ſtudied than that of clearing the lunar diſtance, and many ingenious methods have been deviſed for contracting the operation. Theſe methods are founded on ſome of the following general principles.

The firſt general principle is ſpheric trigonometry, as before explained; the ſecond is the doctrine of proportional errors, by which the effects that the errors in the altitudes produce on the diſtance are ſolved by fluxions, or by the *differential calculus:* and a third principle has been lately diſcovered, which is founded on the properties of a quadrangle inſcribed in a circle, as explained and exemplified by the inventor, Dr. Andrew, in his Aſtronomical and Nautical Tables.

Various methods of working the lunar obſervations have been deviſed chiefly by Halley, Euler, Mayer, Maſkelyne, Lyons, Witchell, Burrow, Borda, Wales, Mackay, Kelly, Gerrard, Andrew, and Mendoza. The methods of the two laſt authors appear the moſt conciſe, but all are ſufficiently correct, and ſeamen generally prefer ſuch as they have firſt learnt. It may indeed be obſerved, that operations which appear the moſt conciſe are not always the moſt expeditiouſly performed, as much depends on the number and variety of tables required, and the manner of applying them. No method has hitherto obtained an excluſive preference over the reſt, nor does it appear poſſible to reduce the calculation to a conciſeneſs to anſwer the general purpoſes or wiſhes of ſeamen; and hence, other modes have been deviſed, of obtaining approximate ſolutions by projection or graphic operation.

The firſt graphic method for clearing the diſtances was that by La Caille, called the *Chaſſis de reduction,* which has ſince been copied by La Lande, Mackay, and others. It is an orthographic projection, conſiſting of a great number of lines accurately drawn, and various ſcales for obtaining the different corrections.

Another graphic operation, of a different deſcription, was executed by the late George Margetts, and publiſhed in 1790. It conſiſts of ſeventy large plates, containing numerous lines drawn from the ſolutions of lunar diſtances in Dr. Shepherd's Tables. By Margetts' Longitude Tables the ſolution of a lunar obſervation may be obtained in about one-fourth of the time required by calculation; and the anſwer, though not perfectly accurate, is ſufficiently correct for the general purpoſes of navigation.

An orthographic projection, founded on the fluxional analogies of ſpheric triangles, has been deviſed by Dr. Kelly, and publiſhed in his Introduction to Spherics and Nautical Aſtronomy, where an inveſtigation of its principles is given (p. 195, edit. 2 and 3.) with a demonſtration,

ſtration, ſhewing, that in all proper altitudes it will give the true diſtance within a few ſeconds. The ſimplicity of this projection is extremely curious, as giving an approximate ſolution of a complicated problem, by drawing four right lines only from the ſcale of chords, and it muſt therefore be very uſeful where great expedition is required.

Lunar *Rainbow*. See Rainbow.

Lunar *Year*, conſiſts of three hundred and fifty-four days, or twelve ſynodical months. See Year.

In the firſt ages, the year uſed by all nations was lunar; the variety of courſe being more frequent in this planet, and of conſequence more conſpicuous, and better known to men than thoſe of any other. The Romans regulated their year, in part, by the moon, even till the time of Julius Cæſar: the Jews too had their lunar months. Some rabbins pretend, that the lunar month did not commence till the moment the moon began to appear; and that there was a law, which obliged the perſon who diſcovered her firſt, to go and inform the ſanhedrim thereof. Upon which the preſident ſolemnly pronounced the month begun, and notice was given of it to the people by fires lighted on the tops of mountains. But this appears ſomewhat chimerical.

LUNARE Os, in *Anatomy*, one of the bones of the carpus. See Extremities.

LUNARIA, in *Botany*, elegantly ſo named by the older botaniſts and by all ſucceeding ones, from *luna*, the moon; on account of the ſilvery ſemi-tranſparent aſpect, and broad orbicular ſhape, of its ſeed-veſſels. Honeſty or Sattin-flower. Linn. Gen. 337. Schreb. 440. Willd. Sp. Pl. v. 3. 476. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 2. 385. Juſſ. 239. Tourn. t. 105. Lamarck Illuſtr. t. 561. Gærtn. t. 142, *rediviva*.—Claſs and order, *Tetradynamia Siliculoſa*. Nat. Ord. *Siliquoſæ*, Linn. *Cruciferæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, oblong, of four ovate-oblong, obtuſe, cohering, deciduous leaves, of which two oppoſite ones are gibbous and pouched at the baſe. *Cor.* cruciform, of four equal, large, undivided, obtuſe petals, as long as the calyx, each tapering down into a claw of the ſame length. *Stam.* Filaments ſix, awl-ſhaped, about the length of the calyx, two of them rather ſhorter; anthers erect, or ſlightly ſpreading. *Piſt.* Germen ſtalked, ovate-oblong, compreſſed; ſtyle ſhort, permanent; ſtigma obtuſe, undivided. *Peric.* Pouch elliptical, compreſſed quite flat, undivided, erect, very large, ſtalked, terminated by the ſtyle, of two cells and two valves; the partition flat, parallel and equal to the valves. *Seeds* ſeveral, projecting into the middle of the pouch, kidney-ſhaped, compreſſed, bordered, ſupported by long thread-ſhaped ſtalks, inſerted into the lateral ſutures.

Eſſ. Ch. Pouch undivided, elliptical, flat, ſtalked; valves equal and parallel to the diſſepiment, flat. Calyx-leaves bagged at the baſe.

1. L. *rediviva*. Perennial Honeſty. Linn. Sp. Pl. 911. (L. græca perennis; Beſl. Eyſt. vern. ord. 1. t. 21. f. 1. Viola lunaris, longioribus ſiliquis; Ger. em. 464. f. 2.)—Leaves doubly and ſharply toothed. Pouches elliptic-lanceolate, acute at each end.—Native of Germany, Switzerland, and Greece. In our gardens it flowers in May or June; and is perennial, but by no means common. The *ſtems* are three or four feet high, erect, round, leafy. *Leaves* on long ſtalks, heart-ſhaped, pointed, nearly ſmooth, doubly, ſharply and finely toothed; the lower ones oppoſite, the reſt alternate. *Flowers* numerous, large, corymboſe, fragrant, crimſon. *Pouch* two inches long and not one broad, elliptical, making a ſharp angle at each extremity, green or browniſh.

2. L. *annua*. Annual Honeſty. Linn. Sp. Pl. 911. Mill. Illuſtr. t. 54. (Viola lunaris, ſive Bolbonac; Ger. em. 464. f. 1.)—Leaves ſimply and bluntly toothed. Pouch elliptical, ſomewhat orbicular, rounded at each end.—Native of Germany and Switzerland; very common in gardens, flowering in May and June. The *root* is annual or rather biennial, tapering. *Stem* ſolitary, branched. *Leaves* with much broader and leſs taper teeth than in the former, in a ſimple ſeries only. *Flowers* copious, large, ſcentleſs, crimſon. *Pouch* glaucous, ſcarcely more than an inch long, and nearly as broad, being almoſt orbicular, rounded at each end.

Linnæus having founded his ſpecific differences of theſe plants on the oppoſite or alternate ſituation of their leaves, in which reſpect they both vary, has led ſome to ſuppoſe they were both the ſame. Nothing however can be more diſtinct than the ſhape of their ſeed-veſſels, to which we have added the different manner in which their leaves are toothed. They alſo permanently differ as to duration.

Willdenow charges Gærtner wrongfully with figuring the pouch of *L. rediviva* for *Ricotia*; the latter differs in not being elevated on a ſtalk above the baſe of the flower, which ſtalk in the ſaid *Lunaria* is an inch long, or more. *Ricotia* is obſerved by Mr. R. Brown, as well as by Gærtner, to have, ſometimes at leaſt, two cells.

L. *annua* was diſcovered wild in Switzerland by M. Schleicher, though Haller ſeems not to have been aware of it.

Lunaria, in *Gardening*, compriſes plants of the herbaceous, annual, and perennial kinds, of which the ſpecies cultivated are, the perennial honeſty (L. rediviva); the annual honeſty, moor-wort, or ſatin-flower (L. annua); and the Egyptian honeſty (L. Egyptiaca.)

In the ſecond ſort the ſeed-veſſels, when fully ripe, become tranſparent, and of a clear ſhining white, like ſatin; whence the name of ſatin flower.

Method of Culture.—Theſe plants may be raiſed by ſowing the ſeed in a ſhady border, or, which is better, in patches in the ſituations where they are to remain, in the autumn, keeping the plants afterwards properly thinned out and free from weeds. They may likewiſe be ſown in the early ſpring; but the former is the better ſeaſon, as the plants riſe ſtronger. The laſt ſort ſhould have an open ſituation. When ſown in beds, the perennial ſort ſhould be ſet out where they are to remain, in the following autumn after being ſown.

Theſe plants all afford ornament and variety in the borders and clumps of pleaſure-grounds, in which the firſt ſort ſhould be placed more backward.

Lunaria, in *Ichthyology*, a ſpecies of *Perca*; which ſee.

Lunaria, in *Natural Hiſtory*, is alſo uſed by ſome authors for the ſelenites.

LUNARIS Cochlea, the name of a genus of ſhells of the ſnail-kind, according to the claſſification of ſome writers, the diſtinguiſhing character of which is their having a perfectly-round mouth. Theſe are univalve, umbilicated ſhells, with a depreſſed clavicle, and a ſurface ſometimes ſmooth, but more frequently ſtriated, furrowed, laciniated, or covered with tubercles.

It is ſaid, that Archimedes took the invention of the ſcrew, ſo famous ever ſince his time, and ſtill called after his name, from the form of this ſhell; and it is generally allowed, that architects have taken the hint of their winding flights of ſtairs from it. See Trochus, Helix, &c. under Conchology.

LUNAS, in *Geography*, a town of France, in the department of the Herault, and chief place of a canton, in the diſtrict of Lodéve. The place contains 1296, and the canton 6122 inhabitants, on a territory of 292½ kiliometres, in 12 communes.

LUNATI, Carlo Ambrosio, in *Biography*, of Milan, ſurnamed *Il Gobbo della Regina*, who came to England in the reign of James II. Lunati was a moſt celebrated performer on the violin, and Geminiani's firſt maſter on that inſtrument.

LUNATIC, Lunaticus, a perſon ſuppoſed to be affected, or governed by the moon. Hence, epileptics were anciently called lunatici, becauſe the paroxyſms of that diſeaſe ſeemed to be regulated by the changes of the moon. Thus Galen, (De Diebus Criticis, lib. iii.) ſays, the moon governs the periods of epileptic caſes: and others referred the diſeaſe entirely to this planet. Aretæus de Diuturnis Morbis, lib. i. cap. 4. See Mead's Treatiſe concerning the Influence of the Sun and Moon upon the Human Bodies, p. 38. 46, &c.

Mad people are ſtill called lunatics, from an ancient but now almoſt exploded opinion, that they are much influenced by that planet. A much ſounder philoſophy hath taught us, that if there be any thing in it, it muſt be accounted for, not in the manner the ancients imagined, nor otherwiſe than what the moon has in common with other heavenly bodies, occaſioning various alterations in the gravity of our atmoſphere, and thereby affecting human bodies. However, there is conſiderable reaſon to doubt the fact; and it is certain that the moon has no perceivable influence on our moſt accurate barometers.

A lunatic, in the contemplation of the law, is properly a perſon who hath lucid intervals; ſometimes enjoying his ſenſes, and ſometimes not. See Non-compos.

The ſtat. 17 Edw. II. cap. 10. ordains, that the king is to provide that the lands of lunatics be ſafely kept, and they and their families maintained by the profits, and the reſidue ſhall be kept for their uſe, and be delivered to them when they come to their right mind; the king taking nothing to his own uſe; and if the parties die in ſuch ſtate, the reſidue ſhall go to their executors or adminiſtrators. A warrant is now iſſued by the king, under his royal ſign manual, to the lord chancellor, or lord keeper, or lords commiſſioners for the cuſtody of the great ſeal, to perform this office for him. All matters, therefore, touching lunatics, are within the peculiar juriſdiction of the court of chancery.

Lunatics are not legally accountable for any crimes they commit in this ſtate. (1 Hawk. c. 1.) And alſo, if a man in his ſound memory commits a capital offence, and before arraignment for it he becomes non-compos, he ought not to be arraigned for it; and if, after he has pleaded, the priſoner becomes mad, he ſhall not be tried: if, after he be tried and found guilty, he loſes his ſenſes before judgment, judgment ſhall not be pronounced: and if, after judgment, he becomes of non-ſane memory, execution ſhall be ſtayed.

By the common law, if it be doubtful whether a criminal, who at his trial is in appearance a lunatic, be ſuch in truth or not, it ſhall be tried by an inqueſt of office, to be returned by the ſheriff; and if it be found by them, that the party only feigns himſelf mad, and he ſtill refuſe to anſwer, he ſhall be dealt with as if he had confeſſed the indictment. 1 Hawk. c. 1. ſ. 4.

By 39 and 40 Geo. III. c. 94.; in all caſes, where it ſhall be given in evidence upon the trial of any perſon for treaſon, murder, or felony, that ſuch perſon was inſane at the time when the offence was committed, and ſuch perſon ſhall be acquitted, the jury ſhall be required to find ſpecially, whether they acquitted him on account of inſanity; and if they do ſo find, the court ſhall order ſuch perſon to be kept in ſtrict cuſtody in ſuch place, and in ſuch manner as to them ſhall ſeem fit, until his majeſty's pleaſure ſhall be known; whereupon his majeſty may give ſuch order for the ſafe cuſtody of ſuch perſon during his pleaſure in ſuch place and manner as to his majeſty ſhall ſeem fit.

When any perſon, who ſhall be indicted for any offence, and upon arraignment ſhall be found by the jury to be inſane, ſo that he cannot be tried, or when upon the trial he ſhall be found to be inſane, the court may record ſuch finding, and order the party to be kept in ſtrict cuſtody until his majeſty's pleaſure ſhall be known; and if any perſon, charged with any offence, ſhall be brought before any court to be diſcharged for want of proſecution, and ſuch perſon ſhall appear to be inſane, the court may order a jury to be impanelled to try the ſanity of ſuch perſon; and if the jury find him to be inſane, the court may order ſuch perſon to be kept in ſtrict cuſtody, &c.; and in all caſes of inſanity his majeſty may give ſuch order, &c. as ſtated above.

And for the better prevention of crimes being committed by perſons inſane, if any perſon ſhall be diſcovered and apprehended under circumſtances that denote a derangement of mind, and a purpoſe of committing ſome crime, for which if committed he would be liable to be indicted, any juſtice, before whom ſuch perſon ſhall be brought, may, if he think fit, iſſue a warrant for committing ſuch perſon as dangerous, and ſuſpected to be inſane, ſuch cauſe of commitment being plainly expreſſed in the warrant; the perſon ſo committed ſhall not be bailed, except by two juſtices, one whereof ſhall be the juſtice who iſſued ſuch warrant; or by the quarter ſeſſions, or by one of the judges.

By 17 Geo. II. c. 5. it is enacted, that whereas there are ſometimes perſons, who by lunacy or otherwiſe are furiouſly mad, or are ſo far diſordered in their ſenſes, that they may be dangerous to be permitted to go abroad, it ſhall therefore be lawful for two or more juſtices, where ſuch lunatic or mad perſon ſhall be found, by warrant directed to the conſtables, churchwardens, and overſeers of the place, or ſome of them, to cauſe ſuch perſon to be apprehended, and kept ſafely locked up in ſome ſecure place within the county or precinct, as ſuch juſtices ſhall under their hands and ſeals direct and appoint, and (if ſuch juſtices find it neceſſary) to be there chained, if the ſettlement of ſuch perſon ſhall be within ſuch county or precinct.

And if ſuch ſettlement ſhall not be there, then ſuch perſon ſhall be ſent to his ſettlement by a vagrant paſs (*mutatis mutandis*); and ſhall be locked up or chained by warrant of two juſtices of the county or precinct to which ſuch perſon is ſo ſent in manner aforeſaid.

And the reaſonable charges of removing, and of keeping, maintaining, and curing ſuch perſons, during ſuch reſtraint (which ſhall be during ſuch time only as ſuch lunacy or madneſs ſhall continue) ſhall be ſatisfied and paid (ſuch charges being firſt proved upon oath) by order of two juſtices, directing the churchwardens or overſeers, where any goods, chattels, lands, or tenements of ſuch perſon ſhall be, to ſeize and ſell ſo much of the goods and chattels, or receive ſo much of the annual rents of the lands as is neceſſary to pay the ſame; and to account for what is ſo ſeized, ſold, or received, to the next quarter ſeſſions: but if ſuch perſon hath not an eſtate to ſatisfy the ſame, over and above what ſhall be ſufficient to maintain his family, then ſuch charges ſhall be paid by the pariſh, town, or place to which ſuch perſon belongs, by order of two juſtices, directed to the churchwardens or overſeers for that purpoſe.

Provided, that any perſon aggrieved by any act of ſuch juſtices out of ſeſſions may appeal to the next ſeſſions, giving reaſonable notice; whoſe order therein ſhall be final.

And nothing herein ſhall reſtrain or abridge the power of the king or lord chancellor; nor ſhall reſtrain or prevent any friend from taking them under their own care and protection.

But the above parts of the act relate to vagrant lunatics only, who are ſtrolling up and down the country, and do not extend to perſons, who are of rank and condition in the world, and whoſe relations can take care of them properly by applying to the court of chancery. 2 Atk. Rep. 52. See MADHOUSES.

When a perſon is legally found to be *non-compos*, (ſee NON-COMPOS,) the lord chancellor uſually commits the care of his perſon, with a ſuitable allowance for his maintenance, to ſome friend, who is then called his *committee*, which ſee. However, to prevent ſiniſter practices, the next heir is ſeldom permitted to be this committee of the perſon; becauſe it is his intereſt that the party ſhould die. But it hath been ſaid, there lies not the ſame objection againſt his next of kin, provided he be not his heir; for it is his intereſt to preſerve the lunatic's life, in order to increaſe the perſonal eſtate by ſavings, which her or his family may be hereafter entitled to enjoy. (2 P. Wms. 638.) The heir is generally made the manager, or committee of the eſtate, it being clearly his intereſt by good management to keep it in condition; accountable, however, to the court of chancery, and to the *non-compos* himſelf, if he recovers; or otherwiſe, to his adminiſtrators. In this care of idiots and lunatics, the civil law agrees with ours; by aſſigning them tutors to protect their perſons, and curators to manage their eſtates. But in another inſtance the Roman law goes much beyond the Engliſh. For, if a man by notorious prodigality was in danger of waſting his eſtate, he was looked upon as *non-compos*, and committed to the care of curators or tutors by the prætor. And by the laws of Solon ſuch prodigals were branded with perpetual infamy. But with us, when a man on an inqueſt of idiocy hath been returned an *unthrift* and not an *idiot*, (which ſee,) no further proceedings have been had. Bro. Abr. tit. Idiot 4.

By 29 Geo. II. c. 31, a lunatic may ſurrender a leaſe in the court of chancery or exchequer, in order to renew the ſame. Alſo, by direction of the lord chancellor, he may accept a ſurrender of ſuch leaſe, and execute a new one. 11 Geo. III. c. 20.

By 43 Geo. III. c. 75. whereas great injury frequently happens to perſons found lunatic or of unſound mind, and incapable of managing their affairs, and the creditors of ſuch perſons are delayed in obtaining payment of their demands for want of ſufficient power to apply the property of ſuch perſons in diſcharge of their debts and engagements, it is enacted that it ſhall be lawful for the lord chancellor, lord keeper, or lords commiſſioners for the cuſtody of the great ſeal, to order the freehold and leaſehold eſtates of ſuch perſons reſpectively to be ſold, or charged by way of mortgage or otherwiſe, for raiſing ſuch ſum of money as ſhall be neceſſary for payment of the debts, and for performing the contracts or engagements of any ſuch perſons reſpectively, and [of] the coſts and charges attending the ſame, and attending ſuch ſale or incumbrance reſpectively, and to direct the committee or committees of the eſtate of ſuch perſons reſpectively to execute in the name and on behalf of ſuch perſons conveyances of the eſtates ſo to be ſold or incumbered, and to procure ſuch admittance to and make ſuch ſurrenders of the copyhold eſtates of ſuch perſons found lunatic or of unſound mind, and to do all ſuch acts as ſhall be neceſſary to effectuate the ſame in ſuch manner, as ſuch chancellor, &c. ſhall direct; which conveyances ſhall be as good in law, as if the ſame had been executed by every ſuch perſon when in his or her ſound mind.

And in caſe of any ſurplus of money to be raiſed by any ſuch ſale as aforeſaid, after anſwering the purpoſes aforeſaid, the ſame ſhall be applied in the ſame manner as the eſtate ſold would have been applied, if this act had not been made.

And whereas many ſuch perſons may be ſeiſed and poſſeſſed of freehold and copyhold lands, &c. either for the term of their natural lives or for ſome other eſtate, with power of granting leaſes and taking fines; reſerving ſmall rents on ſuch leaſes for one, two, or three lives, in poſſeſſion or reverſion, or for ſome number of years determinable upon lives, or for terms of years abſolutely; be it enacted, that in every ſuch caſe every power of leaſing ſuch lands, &c. which is or ſhall be veſted in ſuch perſon, having a limited eſtate only, ſhall and may be executed by the committee or committees of the eſtate of ſuch perſon, under the direction and order of the lord chancellor, lord keeper, or lords commiſſioners; and ſuch leaſe or leaſes ſhall be as good in law, as if the ſame were executed by the ſaid perſon in his or her ſound mind.

And whereas perſons ſo found lunatic or of unſound mind may be ſeiſed or poſſeſſed of, and entitled to freehold or copyhold eſtates, in fee or in tail, and an abſolute intereſt in leaſehold eſtates, and it may be for their benefit that leaſes or under leaſes ſhould be made of ſuch eſtates for terms of years, and eſpecially to encourage the erection of buildings thereon, or repairing buildings actually being thereon, or otherwiſe improving the ſame; be it enacted, that it ſhall be lawful for the lord chancellor, &c. to order and direct a committee or committees of the eſtate of ſuch lunatic to make ſuch leaſes of the freehold, copyhold, or leaſehold eſtates of ſuch perſons reſpectively, according to his or her intereſt therein, and to the nature of the tenures of ſuch eſtates, for ſuch term or terms of years, and ſubject to ſuch rents and covenants, as the lord chancellor, &c. ſhall direct; and that every ſuch leaſe ſhall be as good in the law, as if the ſame had been executed by ſuch perſons in his or her ſound mind.

Every act to be done by ſuch committee or commitees by virtue of this act, and the order of the lord chancellor, &c. ſhall be as valid and binding againſt the ſaid perſons ſo found lunatic and of unſound mind reſpectively, and all perſons claiming by, through, or under him or her reſpectively, as if the perſons ſo found lunatic or of unſound mind reſpectively had been in his or her ſound mind, and had perſonally done ſuch act or acts reſpectively.

Provided nevertheleſs, that nothing herein ſhall extend to ſubject any part of the freehold, copyhold, or leaſehold eſtates of any perſon found lunatic or of unſound mind, to the demands of his creditors, otherwiſe than as the ſame are now ſubject by due courſe of law; but only to authoriſe the lord chancellor, lord keeper, or lords commiſſioners for the cuſtody of the great ſeal of the united kingdom and of Ireland reſpectively, being intruſted by virtue of the king's ſign manual with the care and commitment of the cuſtody of the perſons, and eſtates of perſons ſo found lunatic or of unſound mind, to make order in ſuch caſes as are hereinbefore mentioned, when the ſame ſhall be deemed for the benefit of ſuch perſon ſo found lunatic or of unſound mind, and incapable of managing his or her affairs.

To make a will, it is not ſufficient that the teſtator have memory to anſwer to familiar and uſual queſtions, but he ought to have a diſpoſing memory, ſo as to be able to make a diſpoſition of his eſtate, with underſtanding and reaſon.

For the marriage of lunatics, ſee Marriage.

For lunatic aſylums, ſee Mad-houses.

LUNATION, the period, or ſpace of time, between one new moon and another; alſo called *ſynodical month.* See Cycle and Epact.

LUNAWARA, in *Geography*, a town of Hindooſtan, in Guzerat; 50 miles E. of Amedabad.

LUND, a town of Sweden, in Weſt Gothland, on the Wenner lake; 36 miles N.N.E. of Uddevalla.

Lund, or *Lunden*, the moſt ancient town of Sweden, the capital of Scania, Schonen, or Skonen, of which a proverb is recorded, *viz.* that when our Saviour was born, Lund was in its glory. Lund contains ſcarcely more than 800 inhabitants, carries on but little trade, and is principally ſupported by the univerſity eſtabliſhed by Charles XI., and called, from the name of its founder, "Academia Carolina Gothorum." When Mr. Coxe viſited Sweden, it had 21 profeſſors and 300 ſtudents. The library contains 20,000 volumes. The botanical garden was not in a flouriſhing ſtate, the number of plants not exceeding 1200. Linnæus was matriculated at this univerſity. (See Linnæus.) At Lund was inſtituted, in 1776, a Royal Phyſiographical Society, which was incorporated by the king in 1778. The ſubjects treated of in its acts relate only to natural hiſtory, chemiſtry, and agriculture. Lund is an archbiſhopric. The cathedral is an ancient irregular building, raiſed at different intervals; 21 miles E. of Copenhagen. N. lat. 55° 44′. E. long. 13°.

LUNDA, a town of Sweden, in Sudermanland; 10 miles W. of Nykoping.

LUNDBY, a town of Norway, in the province of Aggerhuus, on the Glomme; 60 miles N.E. of Chriſtiania.

LUNDE, a town of Norway, on a lake of the ſame name; 28 miles W.N.W. of Chriſtianſand.—Alſo, a town of Norway; 17 miles N.W. of Skeen.

LUNDEN, a town of the duchy of Holſtein; 24 miles W. of Rendſborg.

LUNDO, a town of Sweden, in the government of Abo; 8 miles N.E. of Abo.

LUNDRESS, in our *Old Writers*, a ſterling ſilver penny; which had its name from being coined only in London, and not at the country mints.

LUNDSAY, in *Geography*, a town of Pegu, on the W. ſide of the river Ava; 60 miles W.N.W. of Pegu. N. lat. 18° 30′. E. long. 95° 43′.

LUNDSJE, a town of Perſia, in the province of Lariſtan, on the Perſian gulf. N. lat. 26° 38′. E. long. 54° 36′.

LUNDSKORON, a town of Poland; 18 miles S. of Cracow.

LUNDY Island, is ſituated in the mouth of the Briſtol channel, nearly four leagues from the coaſt of Devonſhire, England. It is rather more than three miles in length, and about one in breadth; contains about 2000 acres; and is environed by high and ſteep rocks, which render it inacceſſible, except in one or two places. The only ſafe landing place is on the eaſt ſide; where a ſmall beach admits a ſecure approach, and is ſheltered by a detached portion of rock, called the Iſle of Rats, from the great number of thoſe animals which burrow here. On landing, viſitors are obliged to climb over various craggy maſſes, before they can reach the ſteep and winding tract that leads to the ſummit, which commands views of the Engliſh and Welſh coaſts. About 400 acres only of this iſland are in cultivation; of which 300 are arable, and the reſt paſture: wheat is the chief produce. The elevated ſituation of the land, in ſome places 800 feet above the ſea, and the violence of the N.E. winds, prevent any trees from growing, though a conſiderable expence has been incurred in planting. Rabbits and rock birds are numerous; and in the ſeaſon, lobſters, crabs, and other fiſh may be obtained in abundance. About 400 head of ſheep, and 80 of cattle, are fed here; but the former do not thrive. The incloſures are ſtone fences. Of the hiſtory of the iſland but little is known. Riſdon relates that one Moriſco, who had conſpired to kill king Henry III., retired hither, and turning pirate, committed great depredations; on which the king arreſted, and had him executed on an elevated part. About the middle of the laſt century, it was purchaſed of government by a nobleman, who entruſted it to the care of a perſon named Benſon, a notorious ſmuggler, who carried on a conſiderable illicit traffic. The next proprietor of the iſland was ſir John Borlaſe Warren, who, about the year 1781, ſold it to John Cleveland, eſq.; but it appears to have been recently re-purchaſed by government. The whole rent is but 70*l.* *per annum;* no taxes are paid; nor can it maintain any revenue officer, the duties in ſeven years ſcarcely amounting to five pounds. The number of houſes is only ſeven; the inhabitants, in the year 1794, were but twenty-three. The population of the iſle was probably greater at ſome diſtant period, as many human bones have been ploughed up; and Camden ſays, "the furrows ſhow it to have been once cultivated." The chief antiquities are, the ruins of St. Anne's chapel, and what is termed Moriſco's caſtle. The latter is near the ſouth-eaſt end, and was ſtrongly fortified with large out-works and a ditch; a few old diſmounted cannon occupy the battlement, beneath which is a curious cavern. In the reign of Charles I. lord Say and Seale held the caſtle for the king; and in the time of William and Mary, the French ſurpriſed it by a ſtratagem, plundered it, and kept poſſeſſion for ſome time. Beauties of England and Wales, vol. iv.

LUNE, in *Fortification.* See Demi-lune and Lunette.

Lune, or *Lugne*, in *Geography*, a river of England, which riſes in the county of York, and runs into the Iriſh ſea, a few miles below Lancaſter. N. lat. 53° 57′. W. long. 2° 49′.

LUNE, Lunula, in *Geometry*, is the ſpace included between the arcs of two unequal circles, forming a ſort of creſcent, or half-moon, the area of which may in many caſes be as accurately determined as that of any rectilineal figure. The lune was the firſt curvilineal ſpace of which the quadrature was aſcertained, and this is ſaid to have been firſt effected by Hippocrates of Chios, though others ſay it was diſcovered by Œnopidas of Chios. However this may be, the former geometer has generally had the honour of the diſcovery attributed to him, and the figure ſtill bears his name, being commonly denominated the lune of Hippocrates, the conſtruction of which is as follows.

On the diameter of a ſemicircle (*Plate* X. *Geometry, fig.* 2.) deſcribe a right-angled triangle, of which the angular point will neceſſarily fall in the circumference. Then on each of the ſides A D, D B, deſcribe a ſemicircle, and the two figures A G F D, D H E B will be lunes, and the area of them will be equal to the area of the right-angled triangle A D B. For circles, and conſequently ſemicircles, being to each other as the ſquares of their diameters; and ſince $AB^2 = AD^2 + DB^2$; therefore the ſemicircle $ADB = AGD + DHB$; from theſe equal ſpaces taking away the common ſegments A F D and D E B, there remain the two lunes equal to the triangle A D B; and therefore, if the two ſides A D, D B, become equal, as in *fig.* 3, the two lunes are each equal to half that triangle, and conſequently the quadrature of them is determined, being each equal to a given rectilineal figure; and this is what is properly called the lune of Hippocrates, and it was the only one of which he could determine the area, for though he, in all caſes, had the meaſure of the ſpace of both together, yet it was only in the caſe of equality that he could find the area of the ſingle lune, though he could always determine a lune that ſhould be equal to any given rectilineal ſpace. For in *fig.* 3, the arc D E B is a quarter of a circle to the radius C B, and D H B is a ſemicircle. If, therefore, we conſtruct the iſoſceles right-angled triangle B C A, (*fig.* 3.) equal to any given ſpace, and on A B deſcribe the ſemicircle B D A, and from C as a centre, and with C A as a radius, deſcribe the quadrant B E A, we ſhall have the lune B D E A equal to the given ſpace as required. This, as we have obſerved above, was the firſt inſtance of the quadrature of a curvilineal ſpace, that is, of its being ſhewn equal to a rectilineal figure; for, properly ſpeaking, it is not abſolutely a quadrature, as was that of Archimedes, when he demonſtrated that every parabola was two-thirds of its circumſcribing rectangle; Hippocrates arriving at his reſult only ſtep by ſtep, by ſubtracting equal quantities from equal ſpaces, and hence finally, as by chance, coming to a caſe in which a curvilineal area is equal to a rectilineal one.

This diſcovery of Hippocrates, it ſeems, inſpired him with great confidence of being able to find the meaſure of the circle itſelf; and the reaſoning which has been attributed to him on this ſubject, though very erroneous, is ſtill extremely plauſible. Hippocrates ſuppoſed a ſemicircle A D E B (*fig.* 4.) in which he drew the three chords or radii A D, D E, E B, and on each of theſe chords he deſcribed a ſemicircle and a fourth, as F, equal to them. Then the four ſemicircles A G D, D E H, E I B, and F, being each equal to a quarter of the ſemicircle A D E B, they are therefore together equal to it, and taking away from each the ſmall ſegments A G D, D H E, E I B, we ſhall have on one ſide the rectilineal figure A D E B, equal to the three lunes, together with the ſemicircle F. If, therefore, the area of the lunes be taken away from the rectilineal A D E B, there will remain the area of the ſemicircle F, equal to a given rectilineal ſpace. This reaſoning, however, though ingenious, is ſtill very defective, in conſequence of the lunes employed in this caſe being different from thoſe of which Hippocrates had found the quadrature, for that, as we have ſeen, is bounded by a quadrant of one circle, and the half of another, whereas thoſe in the above figure are bounded by a ſemicircle, and the ſixth part of another circle, which is very different from the former, and the quadrature of it equally as difficult as that of the circle itſelf. All, therefore, that Hippocrates could draw from his inveſtigation, was merely this, that if any geometer ſhould be able to find the area of thoſe lunes, the quadrature of the circle would neceſſarily follow, and as this problem was not at that time thought ſo difficult as it is now known to be, it is not improbable that conſiderable hopes of ſucceſs were entertained after the diſcovery which this able geometer had made of the poſſibility of ſquaring what is indeed apparently a more complex figure than the circle. In fact the quadrature of the circle might be accompliſhed, if we only knew the ratio of the two lunes, deſcribed as in *fig.* 3; for then knowing the ſum of the two, and their ratio, it is obvious that we ſhould have the real area of each, and conſequently, by taking A D equal to the radius B C, the area of the circle would follow, as we have ſhewn above.

But though Hippocrates and the ancient geometers were unable to ſquare any other lune, except that above-mentioned, yet the moderns have found ſeveral other caſes in which the quadrature may be obtained, as alſo certain portions of them cut off by right lines, drawn in certain directions. In the lune of Hippocrates, the radii of the bounding circles are to each other in the ratio of two to one; but if the two circles are to each other as three to one, or as three to two, or as five to one, or five to three, they may alſo be ſquared, or may be conſtructed equal to given ſpaces, by means of the ſimple elements of geometry; but other ratios, as four to one, ſix to one, ſeven to one, &c. require the aſſiſtance of the higher geometry, being of a ſimilar deſcription of problems to thoſe of triſecting an angle, doubling a cube, &c.; and can only be ſolved by the ſame means.

We ſhall take this opportunity of giving a ſummary of ſome of the moſt curious obſervations, added by modern geometers to the diſcovery of Hippocrates.

1. If from the centre F, (*fig.* 5.) there be drawn any ſtraight line whatever F E, cutting off the portion of the lune A E G A, that portion will be quadrable, and equal to the rectilineal triangle A H E. For it may be readily demonſtrated, that the ſegment A E will be equal to the ſemi-ſegment A G H.

2. From the point E, if E I be let fall perpendicularly on A C, and F I and E F be drawn, the ſame portion of the lune A E G A will be equal to the triangle A F I. For it may be eaſily demonſtrated, that the triangle A F I is equal to the triangle A H E.

3. The lune, therefore, may be divided in a given ratio, by a line drawn from the centre F; nothing more being neceſſary than to divide the diameter A C in ſuch a manner, that A I ſhall be to C I in that ratio; to raiſe E I perpendicular to A C, and to draw the line E F: then the two ſegments of the lune A G E and G E C will be in the ratio of A I to C I.

All theſe remarks were firſt made by M. Artus de Lionne, biſhop of Gap, who publiſhed them in a work, entitled "Curvilineorum Amænios Contemplatio," 1654, 4to., and afterwards the following were added by other geometers.

4. If two circles, forming the lune of Hippocrates, be completed, the reſult will be another lune, which may be called the *conjugate* to the former, and in which mixtilineal ſpaces may be found, which may be ſquared as in the preceding caſes.

From the point F, if there be drawn any radius F M, interſecting the two circles in R and M, we ſhall have the mixtilineal ſpace R A M R equal to the rectilineal triangle L A R; which can be eaſily demonſtrated; for it may be readily ſeen that the ſegment A R, of the ſmall circle, is equal to the ſemi-ſegment L A M of the greater.

6. Hence, if the diameter *m* O touch the ſmall circle in F, it follows that the mixtilineal ſpace A R F *m* A will be equal to the triangle A S F, right-angled at S, or to half the lune A G C B A. We might have added here various other properties relating to lunes and their ſegments, but our limits will not admit of it; we muſt therefore refer the curious reader to Ozanam's "Mathematical Recreations," where the ſubject is amply illuſtrated. See alſo the remarks of David Gregory, Caſwell, and Wallis, on the quadrature of the lunula, in Phil. Tranſ. N° 259, or vol. iv. p. 452, New Abridgment; and for "the dimenſions of the ſolids generated by the converſion of the lunula of Hippocrates, and of its parts about ſeveral axes, with the ſurfaces generated by that converſion," ſee De Moivre's paper in the Philoſophical Tranſactions, N° 205, or vol. iv. p. 505, New Abridgment.

LUNELLE-LA-VILLE, in *Geography*, a town of France, in the department of the Herault, and chief place of a canton, in the diſtrict of Montpellier. The place contains 4203, and the canton 9451 inhabitants, on a territory of 145 kiliometres, in 11 communes. N. lat. 43° 40'. E. long 4° 13'.

LUNEN, a town of Germany, in the county of Mark, at the conflux of the Zeſick and Lippe; 20 miles S.S.W. of Munſter. N. lat. 51° 36'. E. long. 7° 37'.

LUNENBURG, a town of Pruſſia, in the province of Natangen; 34 miles S.S.E. of Konigſberg.

Lunenburg, or *Luneburg*, a city of Weſtphalia, capital of a principality, ſituated on the Ilmenau, ſurrounded with moats and walls, fortified with towers, and containing three churches, about 1300 houſes, and 9000 inhabitants. It has alſo three hoſpitals, in each of two of which is a church. The prince's palace and the guild-hall are in the market place. The anatomical theatre was built in 1713, and an academy for martial exerciſes was founded on the ſcite of the convent of St. Michael, which was ſuppreſſed. The burghers conſiſt of four orders, the patricians, the brewers, the merchants and tradeſmen, and the artizans; and to theſe four claſſes ſome others might be added. Since the year 1639 the magiſtracy has been compoſed of one moiety of patricians, and of another of men of letters. The Salze, which is a diſtinct part of the town, encloſed by walls, has its own ſeparate magiſtracy. This town conſiſts of fifty-four ſmall houſes, ſunk in the ground, in each of which are four large leaden pans, containing brine, which is left to exhale for the manufacture of ſalt; and the ſalt water is conveyed into them by a common pipe from the ſeveral ſprings. The ſalt-houſes, being 54 in number, and containing 216 pans, which are daily boiled, and every ſalt-houſe being eſtimated at 40,000 rix-dollars, the capital of the whole Salze much exceeds two millions of rix-dollars. Of theſe ſalt-works a fifth belongs to the ſovereign's due; and the town of Luneburg pays annually to the treaſury near 6000 rix-dollars. Of late the ſalt-trade has very much declined. The exports of the town are ſalt, lime furniſhed by two rocks in its vicinity, and beer. It likewiſe carries on a trade in wax, honey, wool, flax, linen, and frize. Goods are alſo brought here from all parts of Germany, and forwarded by the Ilmenau to Hamburgh and to Lubeck. Luneburg is 36 miles diſtant S.E. from Hamburgh. N. lat. 53° 15'. E. long. 10° 36'.

Lunenburg, or Luneburg-*Zelle*, a principality of Weſtphalia, the ſoil of which is various; conſiſting of fruitful marſh-land that lies along the Elbe, the Aller, the Jetze, and ſome other ſmall rivers, other parts, amounting to upwards of 3000 acres, that are ſandy, and others that comprehend heath, turf-moors, and ſwamps. According to the diverſity of its ſoil, it produces wheat, rye, barley, oats, peaſe, buckwheat, flax, hemp, hops, garden-ſtuff, oak, beech, firs, pines, birch, and alder. The wheat differs in quantity in different diſtricts, ſome ſuper-abounding, and the others being deficient; and ſome breed but few horned cattle and horſes, whilſt they abound in others. The heaths are covered with numerous flocks of a ſmall kind of ſheep, the wool of which is long and coarſe. The culture of bees furniſhes conſiderable quantities of honey and wax. The rivers ſupply plenty of good fiſh. The river Elbe, which traverſes the E. and N. ſides of this principality, ſerves to fertilize the adjacent marſh-lands, and to afford other advantages by its fiſheries, navigation, and tolls. This principality contains three large towns, *viz.* Lunenburg, Velzen, and Zelle, with eleven ſmaller, and thirteen large villages. Its principal manufactures are thoſe of linen, cotton, cloth, ribbons, ſtockings, and hats. The king of Great Britain derived from this principality a ſeat and voice in the college of the princes of the empire, and the circle of Lower Saxony. By the peace of Tilſit, it was annexed to the new kingdom of Weſtphalia.

Lunenburg, a county of Virginia, adjoining Nottaway, Brunſwick, Mecklenburg, and Charlotte counties; about 30 miles long, and 20 broad. It contains 4505 free inhabitants, and 5876 ſlaves.—Alſo, a townſhip in Eſſex county, in Vermont, ſeated on Connecticut river, S.W. of Guildhall, and N.E. of Concord, and containing 393 inhabitants.—Alſo, a townſhip of Worceſter county, Maſſachuſetts, on an elevated ſituation, 25 miles from the Great Monadnock mountain, in New Hampſhire. It contains 14 000 acres of land, on which are 1243 inhabitants, and is more diſtinguiſhed by its ſalubrity than by its wealth. The inhabitants have little intercourſe or trade with their neighbours; but they carry on the nailing buſineſs to advantage.—Alſo, a town of New York, in Green county, now called "Eſperanza," ſituated on the W. ſide of Hudſon's river, oppoſite to the city of Hudſon, and 30 miles S. of Albany. The ſoil of this thriving village, or town, is uneven, nor is the ſoil very good.—Alſo, a county of Nova Scotia, on Mahone bay, on the S. coaſt of the province, facing the Atlantic ocean. Its chief towns are New Dublin, Lunenburg, Cheſter, and Blandford. In Mahone bay, La Have, and Liverpool, ſeveral ſhips trade to England with timber and boards.—Alſo, a townſhip in the above county, ſituated on Merliqueth, or Merliquaſh bay, well ſettled by a number of induſtrious Germans. The lands are good, and well cultivated; 35 miles S.W. by S. from Halifax.

LUNENSE Marmor, in the *Natural Hiſtory of the Ancients*, the name of that ſpecies of white marble, now known among us by the name of the Carrara-marble, and diſtinguiſhed from the ſtatuary kind by its greater hardneſs and leſs ſplendour. It was ever greatly eſteemed in building and ornamental works, and is ſo ſtill. It is of a very cloſe and fine texture, of a very pure white, and next in purity to the Parian marble. It has always been found in great quantities in Italy, and is ſo to this day. See *Carrara* Marble.

LUNES, or Lowings, in *Falconry*, leaſhes or longlaſhes to call in hawks.

LUNETTE, in *Fortification*, an inveloped counterguard, or elevation of earth, made beyond the ſecond ditch, oppoſite to the places of arms; differing from the ravelins only in their ſituation.

Lunettes are uſually made in ditches full of water, and ſerve to the ſame purpoſe as fauſſebrays, to diſpute the paſſage of the ditch.

Lunettes are placed on both ſides of the ravelin, as B, B, *Plate* VIII. *Fortification, fig.* 8. to increaſe the ſtrength of a place: they are conſtructed by biſecting the faces of the ravelin with the perpendicular L N, on which are ſet off 30 toiſes from the counterſcarp of the ditch, for one of its faces; the other face P N is found by making the ſemigorge T P of 25 toiſes; the ditch before the lunettes is 12 toiſes; the parapet three, and the rampart eight. There is ſometimes another work made to cover the ſaliant angle of the ravelin, ſuch as A, called *bonnet*, whoſe faces are parallel to thoſe of the ravelin, and when produced biſect thoſe of the lunettes; the ditch before it being 10 toiſes. There are likewiſe ſome lunettes, whoſe faces are drawn perpendicular to thoſe of the ravelin, within a third part from the ſaliant angle, and their ſemigorges are only 20 toiſes. Mr. Muller recommends the face P N to be perpendicular to that of the baſtion, which would then defend it in a direct manner; and if the ſemigorges of the bonnet A were only ſeven or eight toiſes, it would be leſs expenſive, and its ditch and the covert-way before it would be better defended by the lunettes. Elem. of Fortif. p. 36.

Lunette, in the *Manege*, is a half horſe-ſhoe, or ſuch a ſhoe as wants the ſpunge, *i. e.* that part of the branch which runs towards the quarters of the foot.

Lunette is alſo the name of two ſmall pieces of felt, made round and hollow, to clap upon the eyes of a vicious horſe that is apt to bite, and ſtrike with his fore feet, or that will not ſuffer his rider to mount him.

LUNE'VILLE, in *Geography*, a town of France, and principal place of a diſtrict, in the department of the Meurthe, ſituated between the Veſouze and the Meurthe, in a marſhy plain, which has been drained. An academy was inſtituted here by king Staniſlaus, and furniſhed with a good library. The place contains 9797, and the two cantons 22,334 inhabitants, on a territory of 345 kiliometres, in 37 communes; 13 miles E.S.E. of Nancy. N. lat. 48° 36′. E. long. 6° 34′.

LUNGKORCKE, a town of Pruſſia, in the palatinate of Culm; 10 miles N. of Straſburg.

LUNGOBARDI, in *Ancient Geography*. See Lombards.

LUNGON, in *Geography*, a ſmall iſland on the W. ſide of the gulf of Bothnia. N. lat. 62° 40′. E. long. 17° 48′.

LUNGPOUR, a town of the country of Cachar; 15 miles E. of Coſpour.

LUNGRO, a town of Naples, in Calabria Citra, chiefly inhabited by Greeks; 10 miles S.S.W. of Caſſano.

LUNGRY, a town of Bengal; 36 miles S. of Calcutta. N. lat. 21° 58′. E. long. 87° 35′.

LUNGS, in *Anatomy* and *Phyſiology*, are organs of the body, ſituated in the cheſt, through which the blood paſſes on its courſe from the right to the left ſide of the heart, and in which it is changed from the venous to the arterial ſtate, by means of expoſure to the atmoſpherical air received into theſe organs in reſpiration.

The two lungs, (right and left,) are entirely alike in their compoſition; their ſize is conſiderable, and they conſiſt of ſeveral different tiſſues, which render their ſtructure complicated. Theſe tiſſues are almoſt all vaſcular, which gives to the lungs their characteriſtic ſpongy and ſoft nature. They poſſeſs, beſides the properties ariſing from their organization, only the inſenſible organic contractility, or tonic power. Perhaps the muſcular fibres of the air-veſſels may conſtitute an exception to this obſervation. In conſequence of their vital properties being limited to this tonic power, they are not capable of any motion in themſelves; and they therefore remain motionleſs, unleſs ſome exterior agency puts them in motion; yet, in their functions as reſpiratory organs, they exhibit a continual movement, an alternation of dilatation and contraction, by which the air is firſt received into their interior, and then expelled after a certain interval. If this be interrupted for a very ſhort time, the blood is no longer changed, the circulation ceaſes, and death follows. The lungs then require ſome auxiliary means for the execution of the functions to which they are deſtined; theſe are furniſhed by the conſiderable organs of motion ſurrounding them, which at the ſame time compoſe a ſufficiently firm defence to protect them againſt external injury. The ribs with their cartilages, the ſternum, and the dorſal vertebræ, form the ſolid part of the cavity containing the lungs; the diaphragm and intercoſtal muſcles the moveable parts: the cavity itſelf reſulting from their union, is named the thorax. To the ſides of this cavity we muſt refer the phenomena of dilatation and contraction of the lungs, which are entirely paſſive, and follow the impulſe received from this ſource. Thus the thorax conſtitutes an eſſential part of the reſpiratory apparatus.

But the thorax contains alſo the central organ of the circulation (the heart), and the large blood-veſſels connected with it; thus the apparatus of this function is brought near to, and in a manner confounded at its origin with that of reſpiration. Yet they are diſtinct, by the diſpoſition of the common cavity which contains them. For the heart occupies that part of the cheſt which is formed by the vertebral column behind, by the ſternum in front, and by the aponeurotic centre of the diaphragm below; parts which are either immoveable, or capable only of a ſmall degree of motion. The lungs, on the contrary, occupy the moſt moveable part of the cheſt; thoſe formed by the ribs and intercoſtal muſcles, and the muſcular parts of the diaphragm.

The following account of the reſpiratory apparatus will include deſcriptions, 1ſt, of the cheſt, in which the lungs are contained; 2dly, of the motions which that part is capable of; 3dly, of the membranes lining the cavities; 4thly, of the lungs themſelves; and 5thly, of their functions.

The cheſt or thorax is a conical cavity, ſlightly flattened in front, occupying the upper part of the trunk, and conſequently having a much larger ſhare of the ſkeleton below than above it. Yet, if we compare its poſition to that of the moſt important organs, we ſhall find the latter placed almoſt equally near the viſcera contained in the thorax. The parts ſituated in the head, and thoſe contained in the abdomen differ very little in their diſtance from the heart; while the latter organ is placed at very unequal diſtances from the upper and lower extremities. Hence the heart is the centre of the organs contained in the head and abdomen, while it exerts a much leſs active influence on the lower than on the upper limbs.

The cheſt is ſituated in front of the vertebral column; but the curvature of the ribs, which is very prominent behind, cauſes the cavity to paſs a little beyond the ſpine in that direction, particularly towards the middle. The plane of the front of the cheſt is poſterior to that of the front of the face; commonly it is nearly on a level with that of the abdomen; but the numerous variations of the latter cavity produce correſponding varieties in this reſpect.

A falſe idea would be formed of the cheſt by examining it when covered with ſoft parts, and articulated to the upper limbs. The numerous muſcles ſurrounding it above, the ſhoulder, and particularly the clavicle, give to its upper part an extent in the tranſverſe direction, which does not exiſt in the ſkeleton, where the cheſt repreſents a cone flattened in front and behind, with the baſis downwards and the apex upwards. The longitudinal axis of this cone is oblique from above downwards, and behind forwards; but all its ſides do not partake equally in this obliquity, which belongs only to the anterior and lateral parts: the poſterior, formed by the ſpine, has no concern in it. Hence a vertical line, drawn from the middle of the ſpace, included between the vertebral column and the enſiform cartilage, perpendicularly through the cheſt, would not paſs out at the centre of the ſuperior aperture, but would go in front of the clavicular extremity of the ſternum. The diameters, whether antero-poſterior or tranſverſe, of the cone repreſented by the cheſt, are all larger in proportion as they are nearer the baſis.

In its general capacity the cheſt holds a middle place between the head and the abdomen. Its depth, from above downwards, is much leſs in the natural ſtate, than it appears in the ſkeleton. The diaphragm below forms a conſiderable arch projecting into the cheſt, and very conſiderably leſſening its extent in this direction. But this diminution affects the middle, which is occupied by the central tendon, much leſs than the ſides. Again, the clavicles above very manifeſtly ſurmount the ſternum, and contribute to make the cheſt appear higher than it really is. The breadth is much leſs at the upper part, than it appears to be on the firſt view, becauſe the clavicle and the muſcles enlarge the exterior forms without affecting the internal dimenſions. The capacity conſtantly increaſes in proportion as we proceed downwards. Yet the habit of wearing clothes that are very tight about the waiſt, particularly ſtays, contracts that part, ſo that the cheſt is ſometimes ſhaped like a barrel, narrow above and below, and broader in the middle. The concavity in the dorſal part of the ſpine makes the cheſt more capacious in its middle; yet this enlargement is not equal to the contraction produced by the anterior prominence of the bodies of the vertebræ. In fact, the antero-poſterior diameters are all much leſs extenſive along the middle line of the cheſt than on the ſides; ſo that the ſternum is ſeparated from the ſpine by an interval much ſmaller than that which exiſts between the cartilages of the ribs and the hollows at the ſides of the ſpine.

In the female the cheſt is proportionally broader, but ſhorter than in the male.

Any cauſe of diſtention affecting the abdomen, as pregnancy, aſcites, large tumours, &c. ſtrongly elevates the cheſt, preſſes the ribs together, and diminiſhes the perpendicular axis, while the tranſverſe and antero-poſterior diameters are rather increaſed, particularly below. There are malformations of the cheſt, particularly affecting the ſternum and ribs, which diminiſh the breadth, while they leave the height nearly the ſame. Individuals prediſpoſed to phthiſis are remarkable for this tranſverſe contraction of the cavity, which makes the prominence of the ſternum very conſpicuous in front. In other inſtances the cheſt is affected, in conſequence of deformities of the ſpine: when this is curved, the ribs are brought very cloſe together on one ſide, and are proportionally ſeparated on the other, ſo that the two ſides of the cavity are rendered very unequal. The cheſt, in ſuch inſtances, is generally very prominent.

Deſcription of the particular Bones of the Cheſt.—It is compoſed of a common, and of proper parts. The dorſal portion of the ſpine is the former (ſee SPINE); the ſternum in front, and the ribs on each ſide, are the latter.

The *ſternum* is a ſymmetrical bone, placed in the front and middle of the cheſt, flattened and elongated, broad above, contracted about the middle, then again becoming a little broader, and terminating at laſt below by a prominent point. It is divided into a cutaneous and a thoracic ſurface, a clavicular and an abdominal extremity, and lateral edges.

The cutaneous ſurface is anterior, covered by the ſkin, and more immediately by the aponeuroſes of the ſterno-maſtoidei and great pectoral muſcles: it is marked ſometimes by lines dividing it into ſurfaces of unequal breadths, and correſponding to the original diviſions of the bone. It is a little convex at the upper part, and then flattened. The attachment of the muſcular fibres, and of the ligaments of the ribs, gives it a roughneſs. The thoracic ſurface is poſterior, a little concave, ſmooth, and ſometimes exhibits tranſverſe lines ſimilar to thoſe already mentioned. It correſponds above to the ſterno-hyoidei and ſterno-thyroidei; then, for a ſhort ſpace, to the cellular tiſſue of the mediaſtinum, and afterwards to the triangularis ſterni.

The clavicular extremity is the broadeſt and thickeſt part of the bone. Its middle conſiſts of a broad concavity, almoſt entirely occupied by the inter-clavicular ligament: on each ſide of this is a large ſuperficial excavation, concave from within outwards, and convex from before backwards, articulated to the clavicle, and ſurrounded by ligamentous inſertions. The abdominal extremity is called alſo the enſiform or xiphoid cartilage or appendix. It is thin, flattened, broader above, and terminating in a narrower way below. Its figure varies greatly in different individuals: the lower end ſometimes turns forwards, ſometimes backwards; occaſionally it is perforated. It generally is cartilaginous, in a greater or leſs degree, until the later periods of life. It affords inſertion to the aponeuroſes of the abdominal muſcles; the recti cover it in front, and the diaphragm behind.

The margins of the ſternum are thick, and exhibit ſeven articular cavities, to which the cartilages of the true ribs are articulated. Theſe are oblong, and not very ſmooth. The firſt, which is ſuperficial, and not clearly marked, is immediately below the concavity that lodges the clavicle. The ſucceeding ones are ſeparated by ſlight concavities correſponding to the intercoſtal ſpaces, and become nearer and nearer to each other, in proportion as they are placed lower.

The ſubſtance of the bone is almoſt entirely cellular, and its ſurfaces are covered by a very thin compact ſtratum of bony texture: hence the ſternum is very light in proportion to its ſize. It conſiſts at firſt of eight or nine pieces, encloſed in a maſs of cartilage: theſe are ſoon reduced to ſeven, and then to five; which number continues for a long time, the individual portions being ſtill ſeparated by cartilaginous ſtrata. The firſt of theſe pieces is the largeſt, and is broader above than below; the two following are nearly ſquare, and very ſhort: the fourth is longer; the laſt includes the enſiform appendix already mentioned. This diviſion no longer exiſts in the adult; the pieces are united in the following order. The ſecond is conſolidated with the third, and then the latter with the fourth: the other diviſions generally continue through life; ſo that the ſternum is ordinarily deſcribed as being compoſed of two bones and a cartilage. The firſt bone ends at the ſecond rib, which is articulated between it and the ſecond bone. The two pieces are united by a thin layer of cartilage, and their union is often conſolidated by bone. The enſiform cartilage is connected in the ſame way to the end of the ſecond bone; but after a certain age, it is generally more or leſs oſſified.

The *ribs* are bones of irregular figure, placed in ſucceſſion from above downwards, on each ſide of the cheſt, conſiſting generally, but not conſtantly, of twelve pairs, flattened and rather thin in front, rounded and thicker behind, and more or leſs arched. They differ in length, breadth, and direction. The length, which is inconſiderable in the firſt, is ſuddenly increaſed to a very conſiderable degree in the ſecond; and this augmentation proceeds gradually as far as the eighth. From this they again decreaſe, ſo that the twelfth is about as long as the firſt. The firſt rib is the broadeſt; the ſucceeding ones become narrower, but in an almoſt inſenſible degree. Each individual rib is narroweſt from its vertebral extremity to the angle: it grows broader in front of this part, and increaſes to its ſternal end. The firſt rib forms nearly a right angle with the vertebral column; the following are more and more inclined outwards and downwards, ſo that their vertebral are higher than their cartilaginous extremities. The firſt forms a ſmall, but nearly regular ſemicircle; the ſucceeding ones form leſs perfect ſegments of circles, which increaſe ſucceſſively as far as the eighth, and then decreaſe. All are more curved behind

hind than in the front: and hence ariſes the deep excavation on each ſide of the cheſt, in the former direction, for lodging the lungs. They are all twiſted on themſelves, ſo that the two extremities cannot reſt at the ſame time in an horizontal plane. The point of twiſting is at the angle, conſequently the firſt, which has no angle, does not exhibit this circumſtance, which is the more ſenſible in proportion as the angle is more ſtrongly marked. The ribs are diſtinguiſhed into two claſſes: the ſeven ſuperior ones, articulated to the ſternum, are called *true,* or thoracic; the five inferior, joined to each other in front by their cartilages, which are not connected to the ſternum, are named *falſe,* or abdominal. Each is divided into a vertebral and a cartilaginous extremity, and a body.

The vertebral extremity is poſterior and articulated to the ſpine. It exhibits a rounded and contracted neck, of about an inch in length, reſting on the tranſverſe proceſs of the correſponding vertebra. This neck is ſlightly expanded at its poſterior end, to form the head of the rib, which exhibits a cartilaginous ſurface for articulation with the vertebral column. The ſurface is rounded in its outline, ſingle in the firſt, eleventh, and twelfth ribs, which are each articulated to a ſingle body of a vertebra, and divided by a riſing line into two parts in the nine others, which are ſeverally articulated to hollows formed between two vertebræ. Of theſe two portions the lower is the largeſt.

The cartilaginous extremity is elongated from above downwards, broad and concave in the ten firſt ribs, and narrower in the two laſt. It is moſt cloſely joined to the correſponding cartilages, ſo as to appear perfectly continuous with it.

The body of the rib may be conſidered under four different points of view; *viz.* the external and internal ſurfaces, the ſuperior and inferior margins. 1. On the outſide it is convex, and preſents behind a tubercle, marking the termination of the neck, and divided into two portions: the inner of theſe is a ſmooth cartilaginous ſurface, nearly circular in its figure, articulated to the tranſverſe proceſs of the lower of the two dorſal vertebræ, between the bodies of which the head is articulated; the external is rough, and affords attachment to a ſtrong ligament. This tubercle is confounded with the angle in the firſt rib, and is deficient in the two laſt. In front of this eminence is the angle, or part at which the rib, after being continued from the vertebral column obliquely downwards and outwards, turns forwards: inſtead of being angular, as its name implies, this bend is gentle and rounded. It has a prominent oblique line, not ſeen in the firſt and twelfth, but ſlight in the ſecond and eleventh, and more ſtrongly marked and diſtant from the tubercle, in proportion as the rib is lower down: it gives attachment to the ſacro-lumbalis. Between this angle and the tuberoſity there is a ſurface directed backwards, occupied by the longiſſimus dorſi, and becoming broader as we trace the ribs from above downwards. The reſt of the rib, in front of the angle, forms a nearly ſmooth ſurface, directed upwards in the firſt, where we obſerve in it two ſuperficial impreſſions made by the courſe of the ſubclavian artery and vein, ſeparated by a ſurface, in which the ſcalenus is inſerted, and inclined more and more outwards in the ſucceeding ribs, in proportion as they are lower. In the middle of the ſecond there is a mark from the attachment of the ſerratus anticus, and on the others analogous impreſſions from various muſcles of the cheſt and abdomen, as the obliquus externus, pectoralis minor, ſerratus anticus, ſerrati poſtici, &c.

2. On the inſide the ſurface is uniformly concave and ſmooth, covered by the pleura, directed downwards in the firſt, a little inclined in the ſame direction in the ſecond, but completely internal in the remainder.

3. Above, the body of the rib forms an obtuſe margin, which is internal in the firſt, inclined upwards in the ſecond, and directly ſuperior in all the others. It affords attachment to the intercoſtal muſcles, except in the firſt rib.

4. The inferior margin is ſharp, particularly near the tubercle, and becomes more obtuſe in front. Juſt within this is found the groove of the rib, which is deep at the back part of the bone, becomes gradually ſhallower, and is inſenſibly loſt in the front. It lodges the intercoſtal nerves, but is hardly perceptible in the firſt and laſt ribs. This inferior margin affords attachment to the intercoſtal muſcles.

Theſe bones are thin in compariſon to their length, and have conſequently conſiderable elaſticity, which is not obſerved in any other part of the ſkeleton. They are compoſed moſtly of compact bone, with a little cellular ſtructure in their centre: the latter is more abundant at the anterior and poſterior extremities. They are developed at an early period in the fœtus, and are more perfect at the time of birth than any other bones, except thoſe belonging to the organ of hearing. They are formed from a ſingle point of oſſification, excepting the head, which is not conſolidated to the body till the formation of the ſkeleton is nearly complete.

Sometimes there are thirteen ribs: the thirteenth may be either above or below the ordinary ſeries.

Articulations of the Cheſt.—The cheſt, formed by bones of an arched figure, moſt of which reſt on the ſternum by one end, and by the other on the vertebræ, preſents in front and behind articulations correſponding to theſe relations. The joints, ſeparately conſidered, do not admit of much motion; but the pectoral cavity, taken altogether, enjoys an extenſive power of movement.

The poſterior Articulations of the Cheſt.—The ribs are united to the vertebræ; 1ſt, by the articular ſurfaces of their heads to the cavities in the bodies of the vertebræ, each of which cavities is formed in a ſingle vertebra for the firſt, eleventh, and twelfth, in the two adjoining bones and their connecting fibro-cartilage, for the other ribs; 2dly, by the articular ſurfaces of their tubercles to the tranſverſe proceſſes of the vertebræ, excepting the two laſt ribs, which have not this kind of articulation. The firſt has been called the coſto-vertebral; the latter the coſto-tranſverſal articulation.

The *coſto-vertebral* joints. In each of theſe the union is effected by means of an anterior and an inter-articular ligament, and two ſmall ſynovial membranes. The anterior ligament is a broad, thin, flattened, and irregularly quadrilateral fibrous faſciculus, attached in front, above and below the articular ſurface of the head of the rib, diverging towards the ſpine, and fixed by its ſuperior fibres to the body of the vertebra that forms the upper part of the correſponding cavity, by its inferior to that which forms the lower, and by the middle to the intermediate fibrocartilage. The latter are in general leſs ſenſible than the two former, each of which forms a very diſtinct faſciculus. The diſpoſition of this ligament is not exactly the ſame in the firſt, eleventh, and twelfth ribs, each of which is articulated to a ſingle vertebra; yet the fibres extend a little on the neighbouring vertebræ. It is covered in front by the great ſympathetic nerve, by the pleura, and on the right ſide by the vena azygos: it has a radiated figure, is ſhort and ſtrong, compoſed of longer ſuperficial and ſhorter deep-ſeated fibres, and has ſmall vaſcular intervals. It is applied over the joint, for which, in conjunction with the middle coſto-tranſverſal ligaments, it may be conſidered as forming a kind of fibrous capſule.

The inter-articular ligament does not exiſt in the joints of the firſt, eleventh, and twelfth ribs. It is a more or leſs thick fibrous faſciculus, of a flattened figure, fixed on one ſide to the prominent angle of the head of the rib, and on the other to the correſponding depreſſion of the cavity in which it is received. It ſeparates the two ſynovial membranes from each other, and is continuous with the fibro-cartilage, as we may perceive by ſawing the joint acroſs, ſo as to divide it into a ſuperior and an inferior half.

The ſynovial membranes are double in the joints that poſſeſs the ligament laſt deſcribed; but in the others there is only a ſingle one, covering the whole extent of the correſponding articular ſurfaces, and reflected from the one to the other. Where there are two, each capſule belongs to its correſponding upper or lower half of the articulation, and is ſeparated from the other by the inter-articular ligament. Theſe membranes are not clearly marked, do not exhibit the uſual poliſh on their ſurface, contain a remarkably ſmall quantity of ſynovia, and occupy often a very ſmall ſpace on account of the great ſize of the inter-articular ligament. The latter is ſometimes ſo thick, that it may almoſt be doubted, whether the joint poſſeſſes any ſynovial membrane; in other inſtances, however, theſe membranes are very diſtinct. Although the bones are held together almoſt as cloſely as at the anterior articulations between the cartilages and the ſternum, the joint is not ſo frequently loſt in the old ſubject. Yet anchyloſis does ſometimes occur; and this is a character diſtinguiſhing it from joints where the membrane is clearly marked, which may be anchyloſed from accident or diſeaſe, but hardly ever undergoes this change in the natural progreſs of oſſification.

The *coſto-tranſverſal* articulations are formed by a ſmall ſynovial cavity, a poſterior, a middle, and an inferior coſto-tranſverſal ligament. The latter does not belong to the tubercle and proceſs which are contiguous: but extends from the proceſs to the upper edge of the rib immediately below. The poſterior ligament ariſes from the end of the proceſs, paſſes nearly horizontally outwards, and is inſerted into the rough eminence of the tubercle of the rib. Its fibres are parallel and cloſe, form a very diſtinct faſciculus nearly quadrilateral in its figure, correſpond behind to the muſcles contained in the excavations on the ſides of the ſpinous proceſſes, and in front to the articulation. The middle ligament is a collection of irregular reddiſh fibres, rather cellular than ſtrictly ligamentous, placed between the front of each tranſverſe proceſs, and the correſponding part of the rib. When we forcibly ſeparate theſe parts, we diſtinguiſh the fibres which are torn by the ſeparation: to ſee them entire we ſhould ſaw through the proceſs and rib in their connected ſtate. The inferior ligament is a diſtinct fibrous faſciculus, compoſed of numerous ſtrong and parallel fibres. It ariſes from the root of the tranſverſe proceſs, paſſes obliquely to the upper edge of the rib immediately below, and is inſerted near the vertebral extremity. The firſt and the laſt ribs do not poſſeſs it. It is covered in front by the intercoſtal veſſels and nerves, behind by the longiſſimus dorſi: on the outſide it is continuous, by means of a thin aponeuroſis, with the intercoſtal muſcle, and it completes on the inſide a ſmall cellular ſpace traverſed by the poſterior branch of the nerves. Between this ſpace and the vertebral column there is commonly a ſmall fibrous faſciculus, ariſing from the baſis of the proceſs, and attached to the articular extremity of the rib below, where it is united to the upper part of the radiated ligament. The two cartilaginous ſurfaces, of the tranſverſe proceſs and the tubercle of the rib, are covered by a ſmall ſynovial membrane, which is looſer, contains more ſynovia, and is always more diſtinct than that of the preceding joint. Hence it never becomes anchyloſed by the mere progreſs of age.

Anterior Articulations of the Cheſt.—Theſe are not formed by the bony portions of the ribs, but by a ſeries of cartilages terminating them: the ſeven ſuperior of theſe are joined to the ſternum, while the five inferior, connected to each other, have no other kind of connection. Theſe cartilages muſt be deſcribed before we ſpeak of the articulations. They are not uniform in their length, breadth, and direction. That of the firſt rib is very ſhort; the ſucceeding ones increaſe in length as far as the laſt of the true ribs. Thoſe of the falſe ribs again become ſhorter and ſhorter, ſo that it is ſcarcely perceptible in the laſt. The firſt is the broadeſt, and they become narrower as they are placed lower down. The breadth of the two firſt is nearly uniform throughout; it diminiſhes in the others from the coſtal towards the oppoſite extremity. This diminution, however, is not regular in the ſixth, ſeventh, and eighth, which are conſiderably increaſed in breadth, where they are joined to each other. The firſt cartilage is a little oblique from above downwards; ſo that the angle formed between it and the ſternum is acute above and obtuſe below; the ſecond is nearly horizontal, and follows the ſame direction as the rib to which it belongs. The following cartilages of the true ribs are more oblique from below upwards, and more manifeſtly curved where they ariſe from the ribs in proportion as they are lower. At this curvature the ribs and their cartilages take oppoſite directions: the firſt deſcend from the ſpine, the others aſcend to the ſternum. This curvature is diminiſhed a little in the firſt of the falſe ribs, where, however, it is ſtill very conſiderable, and decreaſes ſucceſſively to the laſt, in which the cartilage follows the direction of the bone.

The general figure of the cartilages correſponds to that of the bones to which they are connected. The ſurface of the body is rather unequal externally, or on the front, ſlightly convex in moſt, covered by the pectoralis major above, by the obliquus externus and rectus below. The firſt gives attachment to the coſto-clavicular ligament. Behind or on the inſide it is ſlightly concave, and correſponds in the firſt five or ſix to the pleura and triangularis ſterni, to the tranſverſus abdominis in the ſucceeding ones. The upper edge is more or leſs concave, and the lower convex: they afford attachment to the intercoſtal muſcles, and form a continuation of the intercoſtal ſpaces, which, as well as the muſcles of the ſame name, become narrower in proportion as they are lower. Thoſe between the ſixth and ſeventh cartilages, and between the latter and the eighth, are interrupted by ſmall articulations, formed by the contiguous cartilaginous ſurfaces.

Each cartilage has an external or coſtal and an internal extremity, which may be alſo called ſternal in the ſeven firſt. The former conſiſts of a ſmall convex and unequal ſurface intimately united to the correſponding concavity in the extremity of the rib. The latter has in the true ribs a ſmall articular ſurface of a convex figure, adapted to the hollow of the ſternum, in which it is received. In the three firſt falſe ribs this extremity is elongated, ſituated immediately under the cartilage above it, and united to it: in the two laſt it is ſeparated from the cartilage above by a marked interval.

In reſpect to their ſtructure, the cartilages of the ribs have a great analogy to thoſe of the larynx. Both are very denſe and compact, exhibit, at firſt view, no marks of organization, although they poſſeſs really a peculiar ſtructure, are difficultly reduced into gelatine by boiling, and are remarkable for their tendency to oſſification. Even in ſubjects not much advanced in age, we frequently find a bony point in the centre of theſe cartilages: this is the commencement of oſſification. Thoſe of the firſt ribs undergo this change moſt readily: they are often completely bony, while the others ſtill exhibit their natural texture. This oſſification is always preceded by a yellowiſh tint, which ſucceeds to the white colour that characterizes the cartilages of the child. When they are converted into bone, they reſemble the ribs in being compact externally and cellular on the inſide. In the rib of an old perſon the cells of the rib and of its cartilage are continuous.

Articulations of the Cartilages of the true Ribs.—Each of theſe has a ſmall ſurface at its ſternal extremity, received into a correſponding hollow of the edge of the ſternum, covered by a thin layer of cartilage. The joint poſſeſſes an anterior and a poſterior ligament, and a ſynovial membrane. The ſeventh rib is moreover united by a peculiar ligament to the enſiform cartilage. The anterior ligament is thin and broad, compoſed of radiated fibres ariſing from the extremity of the cartilage, diverging as they traverſe the front of the articulation, and expanded on the front of the ſternum, where they are mixed with thoſe of the oppoſite ſide, with the perioſteum, and with the fibres of inſertion of the pectoralis major, by which this ligament is covered in front. The ſuperficial fibres are long: the more deeply-ſeated are ſhorter, and proceed directly from the cartilage to the neighbouring portion of the ſternum. They are intermixed, not only with the oppoſite fibres, but alſo with thoſe of the ligament immediately above and below. From the union of all theſe fibres a thick ſtratum is formed, covering and ſtrengthening the ſternum, and more ſtrongly marked below than above. The poſterior ligament differs from the preceding by being thinner and having its fibres leſs apparent: in other reſpects they are nearly ſimilar; that is, they proceed in a radiated manner from the cartilages to the ſternum. The fibrous ſtratum on this ſurface of the bone is as thick as on the other, but it exhibits a more uniform kind of organization. We do not ſee in it the decuſſation of numerous diſtinct faſciculi, but a ſmooth and almoſt poliſhed ſtratum, adhering very cloſely to the bone, with many of its fibres not derived from the ligaments of the ribs, but purſuing rather a longitudinal direction. The ſynovial membrane is remarkable for its ſmall extent, and for the want of poliſh on its ſurface. If we did not diſcern a ſmall quantity of ſynovia in the joint, we might be inclined to doubt the exiſtence of ſuch a membrane. In this reſpect it very much reſembles that of the coſto-vertebral articulation. In general, it is rather more looſe in the two or three lower articulations, than in the ſuperior ones. In the adult it certainly does not exiſt in the firſt: the cartilage is continuous with the bone, which explains the ſmall amount of motion, of which this rib is ſuſceptible. In the articulation of the ſecond rib there is a ſmall inter-articular ligament. A ſmall elongated and very thin fibrous faſciculus goes from the lower edge of the ſeventh rib obliquely downwards and inwards to the front of the enſiform cartilage, where it forms an angle with the ligament of the oppoſite ſide. It is covered by the rectus abdominis.

Articulations of the Cartilages of the falſe Ribs.—We have ſtated, that the neighbouring edges of the ſixth and ſeventh, and of the ſeventh and eighth cartilages, are articulated by means of oblong ſurfaces. Theſe are covered by ſynovial membranes much more apparent, more looſe, and containing more ſynovia than thoſe which are found between the ſuperior cartilages and the ſternum. Sometimes between the fifth and ſixth, more rarely between the eighth and ninth, a ſimilar articulation, and conſequently a ſimilar ſynovial membrane, are found, which manifeſtly refer only to the mobility of theſe cartilages. To maintain the cartilages of the falſe ribs in their poſitions, ſeveral ligamentous fibres, holding them ſtrongly, particularly in front, paſs from the laſt true to the firſt falſe rib; from the latter to the ſecond, and from it to the third. Theſe fibres are particularly evident in front of the ſynovial membranes which we have mentioned. Analogous fibres attach the extremity of each of the firſt three falſe cartilages to the lower portion of the cartilage immediately above it. The only connection of the two laſt is by means of the muſcles. Ligamentous fibres alſo paſs between the cartilages of the ſixth and ſeventh true ribs.

The Cheſt conſidered in general.—We ſhall arrange the deſcription of this cavity under the diviſions of its external and internal ſurface; ſuperior and inferior circumference. The external ſurface compriſes four regions; an anterior or ſternal, a poſterior or vertebral, and two lateral or coſtal. The anterior is the narroweſt, more or leſs flattened or projecting in different ſubjects, and according to the prevalence of certain prediſpoſitions. In the middle we have the cutaneous ſurface of the ſternum, on the ſides the cartilages of the true ribs, and a ſeries of lines, which indicate in each rib the point of its union with the correſponding cartilage. This ſeries may be conceived as united into one general line, running obliquely from above downwards and from within outwards, forming the lateral boundary of the anterior region, which, from this particular diſpoſition, is much broader below than above. Between theſe cartilages broad intervals appear in the firſt true ribs, narrower ones in the laſt: they are ſtill more narrowed in the firſt falſe ribs, but grow broader again in the two laſt of this claſs.

The poſterior region preſents the row of dorſal ſpinous proceſſes; the correſponding portions of the muſcular channels of the vertebræ; the tranſverſe proceſſes of the dorſal vertebræ; their articulations with the tubercles of the ribs; a ſeries of ſurfaces belonging to the latter, broader in proportion as they are lower, comprehended between the tubercles and the angles, and giving attachment to the longiſſimus dorſi; and, laſtly, a general line running obliquely from above downwards and within outwards, formed by the ſeries of angles of the ribs. The diſtance between the angles and the tuberoſities increaſing downwards, determines the obliquity of the line juſt mentioned, the increaſing breadth of the ſurfaces which it terminates, and the form of this region, which is of conſiderable breadth below, and becomes narrower as we trace it upwards. This diſpoſition is analogous to that of the anterior region, where the obliquity of the lateral lines produces in the ſame manner an inequality of breadth.

The lateral regions are convex, narrow above, and broader below, formed by the ribs and the intercoſtal intervals. The latter are, in general, diſpoſed like the bones which form them, but with ſome varieties. They are ſhort, and broad above; then diminiſh ſucceſſively in breadth, and increaſe in length down to the junction of the two claſſes of ribs; after which, without growing broader, they again decreaſe in length to the laſt, which is very ſhort: all of them are broader before than behind; hence the diſtance is much greater between the anterior than the poſterior extremities of the firſt and laſt ribs. Theſe ſpaces are all filled by the intercoſtal muſcles.

The internal ſurface of the cheſt, which lodges the principal organs of reſpiration and circulation, alſo offers four regions to our obſervation. The anterior entirely reſembles that of the external ſurface, and is compoſed of the ſame parts. The poſterior has in the middle a prominence formed by the bodies of the dorſal vertebræ, concave from above downwards, and dividing the cheſt into two internal halves. On each ſide of this is a conſiderable elongated concavity, narrow above, broad below, deeper in the middle than in any other part, and containing the poſterior convexity of the lungs. The lateral regions are concave; formed by the internal ſurfaces of the ribs and the intercoſtal ſpaces. The pleura lines them, as well as the poſterior hollows and the pectoral portion, excepting as much of the latter as correſponds to the mediaſtinum.

The ſuperior circumference is ſmall, in compariſon with the inferior, and repreſents an oval placed tranſverſely. It is formed behind by the vertebral column, in front by the ſternum, and on the ſides by the firſt ribs: the clavicles project a little at their inner ends, ſo as to contract this opening in a ſlight degree. The trachea, the œſophagus, the large blood-veſſels, which either go from the heart to the upper parts of the body, or return from the latter to the heart, and ſeveral important nerves paſs through this opening.

The inferior circumference is very large, at leaſt four times greater than the former, and differs from it in being ſuſceptible of enlargement and contraction. The ſuperior, formed by two ribs nearly immoveable, preſerves always the ſame capacity, and is, moreover, protected by a conſiderable thickneſs of parts from the impreſſions of extraneous bodies, that might tend to contract it. To the mobility of the inferior circumference are chiefly owing the variations in the dimenſions of the cheſt, produced by inſpiration and exſpiration, by cauſes which act on it from within outwards, and dilate it, as dropſy, pregnancy, and the various abdominal tumours, or by thoſe which affect it in the contrary way, and tend to contract it, as the ſtays of women. It ſhould be obſerved, at the ſame time, that the viſcera placed at this circumference can accommodate themſelves to theſe varied dimenſions: while thoſe which paſs through the ſuperior aperture, particularly the trachea, would be affected very dangerouſly by any contraction of its ſides. In this inferior circumference there is a large notch in front, of a triangular figure, with the baſis downwards, the ſides of which are formed by the edges of the cartilages of the falſe ribs: in the apex of the triangle the enſiform cartilage projects. On each ſide of this notch there is a convex edge, formed by the cartilages of the falſe ribs. Behind theſe convexities there is a ſmall notch on each ſide, formed by the inclination of the laſt rib, with reſpect to the vertebral column. Several of the abdominal muſcles are attached to all parts of this circumference.

Developement of the Cheſt.—The heart and the thymus, which are ſituated on the median line of the cheſt, in the fœtus, and are of very conſiderable ſize, require a proportional extent in the antero-poſterior diameters, which then predominate, while the tranſverſe are comparatively ſmall, on account of the imperfect condition of the lungs. The ſternum, ſeparated by a wide interval from the ſpine, makes a conſiderable prominence in front, ſo that a large ſpace is left for the heart and thymus. The poſterior foſſæ, at the ſides of the vertebral column, are ſmall, as the ribs are not much curved at this part; hence the prominences behind, formed at the ſides of the ſpine by the curves of the ribs, are not ſenſible at this time. The cheſt is particularly narrow in this direction at the angles of the ribs. The want of this poſterior curvature is the principal cauſe of the augmentation of the antero-poſterior diameters. In fact, the ribs are nearly as long, proportionally, at this time as afterwards; but they ſwell leſs behind and at the ſides, are thrown more forwards, and, conſequently, carry the ſternum in that direction. Theſe curves are formed in the progreſs of age; the poſterior foſſæ of the cheſt are, conſequently, developed, and the ſternum comes nearer to the ſpine. The tranſverſe diameters are now increaſed; but the general capacity of the cheſt is not much augmented in proportion to other parts, as it loſes in one direction what it gains in the other, and its differences in the fœtus, and in the ſubſequent times, are referrible to the different relations of its diameters. Theſe changes affect the ſuperior and inferior circumferences. The former is more capacious from before backwards, but leſs from ſide to ſide: the latter is very wide between the enſiform cartilage and the ſpine; it is one-third wider here than in the adult, in proportion. The tranſverſe diameters are leſs contracted here than in the reſt of the cheſt; ſo that the inferior circumference altogether is remarkable for its great capacity in the fœtus, a diſpoſition which is accommodated to the very marked volume of the gaſtric viſcera, and particularly of the liver, which it includes.

The different bones of the cheſt are not developed in an uniform proportion. The ribs are almoſt entirely oſſified at the time of birth: they are more approximated, particularly below, probably from the great ſize of the liver. The perfection in the oſſification of the ribs may be explained from the nature of the function in which they are employed. Reſpiration commences at the moment of birth, and requires in its organs as great a degree of perfection as is neceſſary at any ſubſequent age: the newly born child reſpires at once as it will reſpire always. The organs of locomotion, on the contrary, go through a kind of education, advance very ſlowly to perfection, and are, conſequently, ſlowly developed.

The ſternum, which is leſs directly concerned in reſpiration, but concurs more immediately in giving ſolidity to the cheſt, is not ſo much advanced as the ribs: on the contrary, it is almoſt entirely cartilaginous.

The contents of the thorax undergo a great change at the time of birth: the lungs, hitherto contracted, are diſtended by the admiſſion of air to a much greater volume than they poſſeſſed before; and that part of the cheſt which contains them muſt be proportionally increaſed.

Towards the period of puberty, although no remarkable change occurs in the ordinary ſeries of phenomena connected with the growth and progreſs of the bones, yet the form of the cheſt ſeems to acquire its fixed character. It either aſſumes that lateral expanſion, and happy conformation which indicate a vigorous conſtitution, or the ſternum projects in front, and gives the alarming preſage of a diſpoſition to phthiſis. At this time the cartilages become more denſe, and the ligaments ſtiffer. The motions of the ribs are more confined. Hitherto they have been the chief agents in reſpiration: but in future the diaphragm is more exerted. The different pieces of the ſternum are joined; the ribs receive more earthy matter, and become more brittle. At a later period the cartilages begin to be converted into bone at their centres, and oſſification goes on until they are made completely bony. The twiſting of the cartilages, which we ſhall mention preſently, is now impoſſible, and the upper part of the cheſt no longer admits of motion in its individual parts. Hence in the old ſubject reſpiration is effected chiefly by the diaphragm.

Mechaniſm of the Cheſt.—This part of the trunk has two principal uſes to fulfil: it protects the included organs by its ſolidity or power of reſiſtance; and it concurs by its mobility in the various functions of theſe organs, particularly of the lungs. We have to conſider it under this double point of view.

The reſiſtance of the cheſt to the action of external force is different on its anterior, poſterior, and lateral aſpects. 1. The thick muſcles placed behind annihilate the effects of falls and blows on that part. Two prominences formed by theſe muſcles, and ſeparated by a groove correſponding to the ſpinous proceſſes, occupy the place of the two longitudinal channels obſerved in the ſkeleton: theſe ſupport the effects of blows. The proviſions for protection in this ſituation, refer to the ſpinal marrow as much as to the pectoral viſcera. 2. In front, where the muſcles are fewer, the mode of reſiſtance varies in inſpiration and exſpiration. When the cheſt is ſtrongly dilated, the ſternum ſupports any effort directed againſt it in the manner of an arch, and more efficaciouſly in proportion as the inſpiration is ſtronger. In this way, individuals lying on their backs ſupport enormous weights on the front of the cheſt: *e. g.* a blackſmith's anvil, on which a horſe-ſhoe has at the ſame time been hammered. Here, however, the mechaniſm is not the ſame as that by which the cranium ſupports a weight bearing on it perpendicularly: in that caſe the bony arch alone is concerned, the muſcles have nothing to do with the phenomenon. In the cheſt, on the contrary, the external muſcles, particularly the ſerratus anticus, draw the ribs ſtrongly outwards, and reſiſt their depreſſion: they are the active ſupports of the bony arch repreſented by the cheſt. If the force be ſuperior to the reſiſtance, fracture enſues: this may either be direct, and affect the ſternum, which is rare; or it may take place by contrecoup at the part which has experienced the greateſt effort, as in the middle of the ribs. Theſe obſervations manifeſtly apply to the true ribs only. Fractures by contrecoup may alſo take place from ſudden blows, where the muſcles have no time to contract and ſupport the ribs, and the latter are conſequently left to the full operation of the force. In exſpiration the cheſt eludes the force by yielding: the ribs are preſſed inwards, and the viſcera are in ſome degree compreſſed. This yielding is much more manifeſt in the lower ribs. 3. The effects of blows, or violence of other kinds, affecting the ſides of the cheſt, are obviated in nearly the ſame manner, whether in inſpiration or exſpiration. The arch repreſented by the rib has its points of ſupport in the ſternum and the vertebral column: the bone may be directly fractured at the point where the violence is offered, which is the moſt common caſe, or by contrecoup, which is more rare. The ſtrength of the ligaments at the anterior and poſterior articulations is ſo conſiderable, and the ſupport afforded by the tranſverſe proceſſes ſo firm, that luxations cannot take place while the joints are in a healthy ſtate. The laſt ribs, which terminate looſely in the abdominal parietes, cannot be ſaid to offer any reſiſtance to the force which is applied to them: they yield towards the abdomen. The firſt and ſecond ribs are ſo covered by external parts, that they can hardly be affected by blows or other kinds of force.

The motions of the cheſt are directed to two principal objects; its dilatation and contraction, which correſpond to inſpiration and exſpiration. It may be dilated in three different directions; perpendicularly, tranſverſely, and from before backwards. 1. The diaphragm alone is the agent of perpendicular dilatation, and produces alone in the adult thoſe ſlight inſpirations, in which but little air enters the cheſt. Its fleſhy ſides, which correſpond to the lungs, deſcend much more than the tendinous centre, which ſupports the heart. (See Diaphragm.) 2. In the next or greater degree of inſpiration the cheſt is firſt dilated perpendicularly, and then tranſverſely by the intercoſtal muſcles. (See Intercostales.) Beſides the cauſes mentioned in that article for the little power of motion in the firſt rib, we may notice the inconſiderable length and great breadth of its cartilage, and its conſolidation with the ſternum, inſtead of being joined by a moveable articulation. The remarkable ſhortneſs and breadth of the rib itſelf alſo concur in producing the ſame effect. In conſequence of the oblique poſition of the ribs, they cannot be elevated without having their middle carried outwards, which produces a tranſverſe enlargement of the cheſt; moreover, this elevation twiſts the cartilages, which throws the ribs ſtill more outwards. 3. In the preceding motion the ribs are carried a little forwards, and as this effect takes place in a greater degree below, where the ribs are longeſt, the ſternum is carried forwards at its lower extremity, the upper remaining nearly motionleſs; and the cheſt is conſequently enlarged from before backwards. This motion, however, is very ſmall in amount, as we may aſcertain by obſerving the reſpiration of a lean individual; it is inſignificant in compariſon to the motion by which the ribs are carried outwards. As the ſternum correſponds to the heart, while the ribs ſurround the lungs, enlargement is leſs needed in the former than the latter direction.

The contraction of the cheſt, correſponding to exſpiration, is effected by a mechaniſm exactly oppoſite to that which we have juſt explained. It takes place from below upwards by the elevation of the diaphragm. In the tranſverſe direction it is effected by the depreſſion of the ribs, which are carried inwards by the twiſted cartilages recovering their original ſtate. The elevation of the bone in inſpiration produces a twiſting of the cartilage; and in exſpiration the recovery of the latter depreſſes the former; ſo that the bone and the cartilage reciprocally determine motion in each other. The effect of this twiſting of the cartilages muſt not, however, be over-rated: in order to make it conſiderable, they ought to be conſolidated to the ſternum, whereas their articulation to that bone allows a certain degree of motion. The greater this motion, the leſs will be the twiſting; and it would not exiſt at all if the articulation were looſe enough to allow full ſcope to the elevation of the rib. It cannot have any effect in the falſe ribs. In proportion as the ribs deſcend and are carried inwards, the ſternum is alſo reſtored, its inferior portion paſſing backwards.

All theſe movements, whether of dilatation or contraction, are much more ſenſible at the lower part of the cheſt, in conſequence of the more extenſive motion enjoyed in this part; a circumſtance that coincides with the greater breadth of the inferior portion of the lungs.

We have to point out, in the next place, the powers by which theſe motions of the cheſt are effected. We may diſtinguiſh two kinds of changes taking place in the cheſt; an enlargement and ſubſequent contraction in the perpendicular direction, and another acting circularly. The diaphragm is the ſole agent of the perpendicular enlargement; and as it extends the cheſt downwards, where the cavity is moſt ample, it produces a very conſiderable dilatation. (See Diaphragm.) This muſcle can deſcend three inches, or more, and has four or five times as much effect in the enlargement of the cheſt, as all the other powers put together. Hence injuries or diſeaſes of it produce the greateſt diſturbance in the function of reſpiration. The perpendicular contraction is effected by the abdominal muſcles; that is, by the obliqui externi and interni abdominis, the tranſverſi and recti. Theſe, which form the ſides and front of the abdominal parietes, yield to the viſcera thruſt downwards by the deſcent of the diaphragm: hence an elevation of the belly is perceptible on inſpiration. They then contract, puſh backwards and upwards the parts which had before deſcended, reſtore the diaphragm to its former ſtate, and conſequently diminiſh the capacity of the cheſt.

The enlargement of the thorax in the circular direction is ordinarily effected by the intercoſtal muſcles, (ſee INTERCOSTALES): and the ſubſequent contraction is owing partly to the reſtoration of the ribs by the elaſtic power of their cartilages, and partly to the action of the triangularis ſterni. But other powers aſſiſt occaſionally, when the circulation and conſequently the breathing are hurried; or when diſeaſe of the cheſt cauſes this function to be performed laboriouſly. Under ſuch circumſtances, every muſcle is brought into action that can aſſiſt in elevating the ſternum or ribs, or in fixing the upper pairs of theſe bones. Hence the ſcaleni, ſterno-cleido-maſtoidei, ſubclavii, cervicales deſcendentes, levatores coſtarum, ſerrati magni, ſerrati poſtici ſuperiores, latiſſimi dorſi, pectorales majores & minores, and trapezii are all employed. The ſhoulders are elevated, the neck is ſtretched, and the head itſelf thrown backwards in the moſt violent efforts of difficult exſpiration. There are alſo auxiliary powers occaſionally employed in exſpiration, but theſe are not ſo numerous as thoſe concerned in inſpiration. The ribs may be depreſſed, not only by the triangularis ſterni, but alſo by the obliqui, recti and tranſverſi abdominis, the quadrati lumborum, longiſſimi dorſi, ſacro-lumbalis, and ſerrati poſtici inferiores.

In the healthy ſubject the enlargement and contraction of the cheſt conſtantly ſucceed each other, and are performed in a regular alternate manner. The diaphragm and abdominal muſcles ſeem to be chiefly employed; but the intercoſtal muſcles alſo aſſiſt. In the female the latter powers are more concerned in reſpiration than in the male.

Although both modes of reſpiration are obſerved to concur in this function in the natural ſtate, it may be and often is carried on by one excluſively. When a rib is broken, or the pleura inflamed, motion of the cheſt is exceedingly painful, and the diaphragm and abdominal muſcles carry on the functions alone. On the contrary, in inflammation of the peritoneum, in the laſt periods of pregnancy, in large dropſical accumulations, the abdominal muſcles and diaphragm cannot act, and the intercoſtals only are then concerned.

In ordinary reſpiration, enlargement and contraction of the cheſt, or inſpiration and exſpiration, are performed in regular alternate ſucceſſion: but this order is often interrupted, and various modifications of the proceſs take place, diſtinguiſhed by particular names.

In *ſtraining*, the diaphragm and abdominal muſcles act together; a deep inſpiration is firſt made, and the diaphragm deſcends conſiderably; the abdominal muſcles then contract, but do not expel air from the cheſt, as they are reſiſted by the former power. The act of ſtraining takes place in all powerful exertions of the body: by it the trunk is fixed, and affords a firm point from which the limbs may be moſt advantageouſly moved. The erectors of the ſpine at the ſame time extend that part, and firmly maintain it in that poſition. Thus all the power of the muſcles moving the limbs is employed in jumping, dragging, puſhing, moving a weight, &c.; and none is loſt in moving the thorax or pelvis towards the limbs, which would be the caſe if thoſe parts of the trunk were not previouſly fixed. So long as the effort laſts, it is obvious that reſpiration muſt be interrupted; hence it is called, in common language, holding the breath: and when it is too long continued, all the inconveniences ariſing from ſuch interruption take place.

The powerful action of the diaphragm and abdominal muſcles ſubjects the contents of the abdomen to preſſure: it impels them and whatever they may contain towards the cavity of the pelvis, and muſt alſo compreſs the blood-veſſels and abſorbents. Hence this effort is employed in expelling the contents of the ſtomach in vomiting, in evacuating the rectum and urinary bladder, and in parturition; it is ſo eſſential in all theſe caſes, that the different objects juſt mentioned could not be accompliſhed without it. Of the amount of the force exerted we may form ſome eſtimate, when we ſee the effects occaſionally produced by ſuch efforts;—the contents of the abdomen are protruded and form ruptures, the viſcera are torn, and the tendons of the abdominal muſcles lacerated.

Whether the paſſage of bile through its ducts, or of calculi through the ſame tubes or the ureters be facilitated by ſtraining, is a doubtful point.

In *panting* there are ſhort and frequent inſpirations, ſucceeded by ſhort and quick exſpirations. It is accompanied with great anxiety, and is attended with, or cauſed by, a more rapid return of blood to the lungs; hence it heats and fatigues. It is produced by violent motion of the body, in wounds of the cheſt, in diſeaſes of the reſpiratory organs, and often in the ſtruggle preceding death.

A long and deep inſpiration, followed by an exſpiration of the ſame kind, conſtitutes *a ſigh*. It ſeems to be an effort at promoting the paſſage of the blood through the lungs; and has been ſaid to be employed when the action of the heart is languid, when it is oppreſſed by the quantity of the blood, or when obſtacles exiſt to its paſſage through the lungs. Sighing takes place under mental affliction or conſiderable bodily fatigue: we generally recover from a ſtate of ſyncope by a ſigh, and aſthmatic perſons frequently ſigh.

In *yawning* there is a ſtill larger inſpiration than in ſighing, performed in a very ſlow and protracted manner, and accompanied by a ſimilar correſponding exſpiration. In both a peculiar ſound is uſually produced. The mouth is opened widely, indeed to the utmoſt extent that the articulation of the lower jaw will allow. Yawning is often ended by a ſigh. That it is produced by bodily fatigue, obſerved moſt frequently on the approach of ſleep and on waking, and takes place alſo when hunger is troubleſome; alſo that newly born children yawn in their firſt attempts at reſpiration, are well known facts; but we cannot explain how this happens. Soemmerring ſays, "that the circulation of the blood through the lungs goes on more ſlowly before yawning; and that we endeavour to obviate by a ſtrong inſpiration, which may promote the circulation through the lungs, the ſenſe of weight, inconvenience, and ſleepineſs that would ariſe from this cauſe." De Corporis humani Fabrica, t. vi. p. 82.

Coughing is an effort of the reſpiratory organs, generally made for the purpoſe of removing from the trachea or its branches ſome irritating matter, as mucus, pus, or any foreign body, through the means of powerful exſpirations, preceded by ſimilar inſpirations. Yet the preſence of a ſtimulus in the ſituation juſt mentioned is not neceſſary, although it is the moſt frequent cauſe: irritation of the diaphragm, as from diſeaſed liver, or an action of the will, can produce coughing. A large quantity of air furniſhed by a conſiderable inſpiration, is violently and ſuddenly expelled, with a conſiderable noiſe, by a very ſtrong and almoſt convulſive exſpiration, and in its paſſage clears away mucus, or any thing elſe which may happen to be in the air paſſages. The air may be driven out at once or at ſeveral exſpirations: in the latter caſe the exſpirations are continued often as long as any air can be expelled, and the emptied cheſt is again ſupplied by an inſpiration accompanied with a peculiar noiſe, as in the hooping cough. Violent and protracted coughing from the interruption of the reſpiratory phenomena, is accompanied with turgeſcence and livid colour of the parts about the head, and with a ſenſe of ſuffocation: when continued for a long time it cauſes head-ache, ſoreneſs of the cheſt, &c.

Sneezing is an action ſimilar in its nature; but more violent in degree than coughing; and it has a different cauſe, *viz.* irritation of the membrane lining the noſe. A ſhort but generally full inſpiration is followed by a moſt vehement exſpiration, ſhaking almoſt the whole body. The expelled air, which in coughing paſſes through the mouth, is directed in ſneezing, through the noſe, for the purpoſe of removing the irritating cauſe. Any extraneous bodies brought into contact with the pituitary membrane, as inſtruments or irritating powders, ſuch as ſnuff, &c. or its own mucous ſecretion, and in ſome individuals ſudden expoſure to ſtrong and dazzling light, will produce ſneezing. Although it is an involuntary effort, it may be in ſome degree increaſed or diminiſhed by the will. It is a ſingular fact, that preſſure about the bridge of the noſe, applied when the inclination is felt, will generally prevent it.

How far the following obſervation of Soemmering tends to elucidate the manner in which ſtimuli applied to the pituitary membrane act on the reſpiratory muſcles, in exciting this convulſive motion of them, is left to the judgment of the reader. "Sneezing ariſes from ſome re-action of the brain, when irritated, through the medium of the naſal nerves, *i. e.* the olfactory and fifth pairs, upon the phrenic nerve; and that it muſt be produced in this way is proved by the fact, that the phrenic and theſe nerves have no connection out of the head." De Corporis humani Fabrica, t. vi. p. 84.

In *laughing*, a full inſpiration is followed by frequent, imperfect, and as it were broken exſpirations, by which the cheſt is not completely emptied. As reſpiration is hurried beyond its natural rate in this act, the circulation is rather quickened; and from the convulſive kind of action in which it conſiſts, a general agitation muſt be imparted to the abdominal contents. In many individuals, a very obvious ſhaking of the cheſt and abdomen accompanies laughter, particularly when violent, ſo as to have become matter of very common obſervation: hence the ſoreneſs experienced from its long continuance. The features are at the ſame time affected in a peculiar manner. In ſome individuals the latter circumſtance is chiefly obſerved. The ſlighter caſes of laughter, which are rather called ſmiling, conſiſt merely of this change of features; but when it goes further, the diaphragm and abdominal muſcles are brought into action. A conſiderable production of ſound takes place at the ſame time, repreſenting in men chiefly the vowels *a* and *o*; in women *e* and *i*. The mouth and its neighbouring parts are principally affected in the face; the corners are drawn upwards and outwards, ſo as in many caſes to expoſe the teeth; the cheek is ſwelled, and the general elevation of the integuments raiſes the lower eye-lid, ſo as to contract the aperture between the two lids. As the interruption in the regular performance of reſpiration produces turgeſcence about the head in violent and long continued laughter, the lacrymal ſecretion is augmented, and a copious flow of tears often enſues.

The cauſes of laughter are partly moral and partly phyſical; with the former we have nothing to do in this article, except to obſerve that laughing and weeping ſeem quite peculiar to the human ſubject. Gentle friction and preſſure of various parts of the body, as the ſoles of the feet, the axillæ, hypochondria, &c. commonly called tickling, are the chief of the latter kind.

Involuntary laughter is a ſymptom of ſome diſeaſes, as hyſteria; and the ancients were of opinion that injuries of the diaphragm produced it: in this caſe they called it riſus ſardonicus. Modern obſervations do not confirm this fact.

Weeping begins with a deep inſpiration, which is followed by ſhort, interrupted exſpirations, at longer intervals from each other than in laughing: theſe often ſhake the thorax and abdomen, and even the head. They are finiſhed at laſt by a ſtrong exſpiration, followed by another inſpiration or a ſigh. This, like laughing, is generally produced by certain mental affections; but in ſome inſtances it owes its origin to phyſical cauſes, as bodily pain; and diſeaſes, as hyſteria, hypochondriaſis, &c. Children generally cry immediately on their birth. The features are conſiderably affected in weeping; the eye-lids are contracted, and the fore-head wrinkled: the mouth has its corners drawn downwards.

Hiccough is ſometimes aſſociated with weeping. It conſiſts of a full, violent, ſonorous, and ſhort, or ſometimes even convulſive involuntary inſpiration through a contracted glottis. Some conſider that the epiglottis is concerned in producing the peculiar ſound of hiccough, and that this organ is ſtruck by the air as it forcibly enters the larynx. The diaphragm appears to be the part principally concerned in this convulſive inſpiration. Sometimes an expulſion of air from the ſtomach through the œſophagus is joined with hiccough. Two, three, or more natural inſpirations and exſpirations take place in the interval between two hiccoughs. It may be occaſionally prevented by depreſſing the diaphragm, and thus holding the breath; or by ſwallowing ſomething ſlowly.

There are many cauſes exciting it. The nearneſs of the ſtomach to the diaphragm occaſions the latter to be often affected by particular ſtates of the former organ. Eating or drinking too much, or unwholeſome articles, is a frequent ſource of the complaint. Wounds or diſeaſes of the ſtomach, or of the diaphragm, may produce it; as alſo various general diſeaſes of the frame, in which it often appears as the precurſor of death.

Inſpiration is immediately concerned in the act of *ſucking*. The lips are cloſely applied round an object, *e. g.* thoſe of the child to the mother's nipple. The air contained in the mouth is then more or leſs completely exhauſted by inſpiration, and the preſſure of the ſurrounding air forces into this more or leſs complete vacuum the contents of the lactiferous tubes. When a liquid is ſucked through a tube into the mouth, the vacuum is formed in that tube, which is embraced by the lips, and the air, preſſing on the ſurface of the liquor, forces it up the tube into the mouth. If the lips are directly immerſed in the fluid, a vacuum is formed, and the fluid riſes into it exactly in the ſame way. The act of *drinking* is effected on the ſame principles.

Deſcription of the Pleura and Mediaſtinum.—The pleura is a thin tranſparent ſerous membrane, lining the cavity of the thorax, and reflected over the contained lungs. Each of the latter organs is encloſed in a particular bag of its own, which bears the ſame relation to the lung, as the pericardium does to the heart; ſurrounding it like a looſe bag or ſheath, and immediately inveſting its ſurface: hence we naturally diſtinguiſh two parts of this membrane, *viz.* the lining of the cheſt (pleura coſtalis), and the external covering of the lung (pleura pulmonalis.)

As there are two lungs, there muſt alſo be two pleuræ, a right and a left. We may form a notion of them by conceiving two membranous bags, forming entire and imperforated cavities, placed laterally with reſpect to each other, and forming, by their appoſition, a partition dividing the cheſt into a right and a left ſide, and containing in its ſubſtance ſeveral of the organs belonging to this cavity. That the two membranous bags are perfectly diſtinct, ſo that nothing can paſs from one to the other, is rendered obvious; 1ſt, by anatomical examinations, in which they may be ſeparated without any injury; 2dly, by experiments on dead bodies, in which fluids may be thrown into one pleura without paſſing into the other; and 3dly, by obſervations on diſeaſed ſubjects, in which water, pus, &c. are often contained for long periods in one pleura only.

In order to underſtand the relations of the pleura to the lungs and to the other thoracic organs, let us deſcribe it as if it began behind the ſternum. From this part it extends outwards, covering the ribs, their cartilages, and the internal intercoſtal muſcles, conſequently lining the ſides of the cheſt. At the heads of the ribs it covers the ganglia of the great ſympathetic nerve, and their branches. When it has reached the back of the cavity, and the vertebral column, inſtead of paſſing in front of that column, it is continued from behind forwards, on the ſide of the aorta and the œſophagus, in front of which it is applied againſt the membrane of the oppoſite ſide, to form the poſterior part of the mediaſtinum. It would be continued in this way from the ſpine to the ſternum through the whole length of the cheſt, if it did not meet with the faſciculus of veſſels entering the root of the lung; it is reflected over theſe, and over the ſurface of the lung, to the ſubſtance of which it is cloſely connected, forming its exterior covering. At the front of the root of the lung it covers the anterior ſurface of theſe veſſels: then is continued from behind forwards on the ſide of the pericardium. It is then applied to the bag of the oppoſite ſide, to form the front of the mediaſtinum, and, laſtly, terminates on the back of the ſternum, where we ſuppoſed it to begin. Below it extends over the whole ſuperior ſurface of the diaphragm.

Thus it appears that the figure of the pleuræ is completely determined by that of the cavity which the membranes line. Each of theſe bags is conical: it riſes into an obtuſe point within the ſpace included by the firſt rib; on the anterior, outer, and poſterior aſpects it is convex, where it lines the ribs and intercoſtal muſcles; below it is concave and expanded over the diaphragm; and on the inſide, where it contributes to the mediaſtinum, nearly plane, but ſlightly concave in the ſituation of the heart. Some anatomiſts diſtinguiſh in the pleura three portions, according to the parts of the cheſt which they cover: *viz.* the coſtal, the diaphragmatic, and the mediaſtinal.

The pleuræ adhere with different degrees of firmneſs to the parts which they line. The medium of this connection is a cellular tiſſue, continuous below with that of the abdominal parietes, above with that of the neck and upper extremities, and in all directions with that which fills the interſtices of the muſcles forming the ſides of the cavity. In the neighbourhood of the vertebræ, and in ſome parts of the mediaſtinum, this tiſſue is copious, and often contains fat: the adheſion is cloſer to the ribs and intercoſtal muſcles, and moſt firm to the diaphragm.

The relative ſituation of the two bags varies at different parts of the cheſt, as different organs are interpoſed between them. Towards the upper and anterior part, immediately under their obtuſe points, behind the arteries coming from the arch of the aorta, and above the pericardium, they are contiguous and ſeparated only by cellular texture. In the middle and lower part of the cheſt, they are widely ſeparated by the intervention of the heart, pericardium, large blood-veſſels, &c. Hence the axis of the cavity muſt paſs from above obliquely downwards and outwards.

The right and left do not preciſely correſpond to each other. The former, on account of the oblique poſition of the heart, lines nearly the whole poſterior ſurface of the ſternum: hence it is broader than the left; but it is at the ſame time ſhorter, becauſe the diaphragm is more ſtrongly arched on this ſide. The left is applied, for the ſpace of ſome inches, to the aorta.

The capacity of the two pleuræ taken together is about one hundred cubic inches in the dead body. It is generally larger in the male than in the female ſex; and is very diſproportionately ſmall before birth. The right exceeds the left in the ſame proportion as the right is larger than the left lung.

The *mediaſtinum* is the partition which ſeparates the two bags of the pleuræ, and divides the cheſt into a right and a left ſide. It is formed by the appoſition of the two membranous ſacs, and extends from the vertebral column to the ſternum and cartilages of the left ribs. We deſcribe in it two lateral ſurfaces, a poſterior and an anterior edge, a baſis and an apex. The lateral ſurfaces are ſmooth, and contiguous to the internal ſurfaces of the lungs, except where the pulmonary veſſels enter thoſe organs: they form the inner portions of the two bags of the pleuræ. The poſterior edge is attached to the ſpine, of which it exactly follows the direction. The anterior is fixed in an oblique line to the ſternum above, and to its edge and the cartilages of the left ribs below. Hence, if we thruſt a pointed inſtrument through the middle of that bone, it will penetrate the right pleura, and not touch the mediaſtinum. The oblique poſition of the heart ſeems to carry with it, as a conſequence, this obliquity of the mediaſtinum. Yet this diſpoſition does not hold univerſally: in ſome ſubjects the mediaſtinum deſcends along the middle of the ſternum: in others, which indeed are very rare, it is inclined from left to right, ſo that the right ſide of the cheſt is narrower than the left. Sometimes the right layer of the mediaſtinum is fixed to the middle of the ſternum, while the left is attached at the articulations of the cartilages. The baſis of the mediaſtinum correſponds to the ſuperior ſurface of the diaphragm, and preſents a wide ſeparation of the pleuræ, lodging the heart and pericardium. The apex correſponds to the upper end of the cheſt; it encloſes the trachea, the œſophagus, and the veſſels and nerves which are entering into or going out of the cheſt.

The mediaſtinum is formed by the two pleuræ, which, inſtead of coming into contact with each other, leave a conſiderable interval between them filled by various organs. Above and in front, they lodge the thymus; below and in front, the heart with its pericardium, and the large veſſels connected to its baſis; behind, the œſophagus and aorta. The two laminæ of the mediaſtinum touch each other only in front of the pericardium, between the lower end of the thymus and the diaphragm, and behind that membrane, in front of the œſophagus, from the firſt dorſal vertebra to the cardiac orifice of the diaphragm. The latter circumſtance has occaſioned a diviſion of the mediaſtinum into an anterior and a poſterior part; the firſt includes all that is placed in front of the œſophagus, the latter all behind it. Theſe diviſions are often called anterior and poſterior, or ſternal and dorſal mediaſtina. The former is the broadeſt and ſhorteſt of the two; it ends about the fifth or ſixth rib; while the latter extends to the eleventh.

In the anterior mediaſtinum, or triangular ſpace placed behind the ſternum and cartilages of the left ribs, beſides ſome fat and cellular ſubſtance, and ſome abſorbing glands, we have the thymus, the trunks of the internal mammary arteries, and the heart. In the poſterior mediaſtinum, or interval of the pleuræ immediately in front of the vertebræ, are found, in addition to ſome adipous and cellular texture, and ſeveral abſorbing glands, the end of the trachea with the commencement of the bronchi, the greateſt part of the œſophagus, with the nerves of the eighth pair, the pulmonary artery and veins, the deſcending aorta, the thoracic duct, and the vena azygos.

When the ſternum is raiſed, in order to expoſe the contents of the thorax, the ſpace ſeparating the two pleuræ behind that bone, and forming the anterior mediaſtinum, is increaſed, becauſe the membranes are partly detached from the ſternum and ribs, to which they before adhered. The cellular ſubſtance occupying the interval becomes filled with air, and is conſequently rendered more ſenſible.

The laminæ compoſing the mediaſtinum are rather thinner than the pleuræ in other ſituations. They are united to each other, and to the parts included between them, by a cellular tiſſue continuous with that of the general external ſurface of theſe bags. This tiſſue, as well as that connecting the different parts together, is tolerably copious, and contains more or leſs fat. It is ſuſceptible of inflammation and ſuppuration, as in other parts of the body; but leſs frequently. Hence abſceſſes ſometimes occur here. The laminæ of the mediaſtinum are, however, more cloſely attached to the ſurface of the pericardium; it is difficult to ſeparate the two membranes completely. The right lamina is more tenſe than the left; a conſiderable protuberance is obſerved in the latter, and formed by the ſituation of the heart: hence the former only, if either, can have any effect in ſupporting the diaphragm.

The mediaſtinum receives its peculiar blood-veſſels. In front its arteries come from the internal mammary, and the comes nervi phrenici; behind, from the inferior thyroid, the ſuperior intercoſtal, the pericardiac, œſophageal, and bronchial arteries. The veins correſpond to, and accompany theſe.

The mediaſtinum divides the cheſt into two lateral halves; ſeparates the membranous bags containing the lungs, and renders their action independent of each other. It confines alſo to one ſide various morbid affections, as effuſions of blood, pus, &c. Some phyſiologiſts conceive that it is further uſeful, by ſupporting the weight of the oppoſite lung, when we lie on the one ſide, and protecting therefore the lung of the ſame ſide on which we lie.

The pleura is nearly tranſparent, ſo that we can eaſily diſtinguiſh through it the colours of the ſubjacent parts. The fibres of the diaphragm and intercoſtal muſcles, the intercoſtal veſſels and the ribs are immediately diſcerned through this membrane. We can ſtill more clearly perceive all the ſhades of colour in the lung through the pleura pulmonalis; this indeed is thinner than the pleura coſtalis, and adheres very cloſely to the organ. Boiling deſtroys this tranſparency, and gives the membrane a dirtyiſh white appearance. It is very ſtrong in proportion to its thickneſs. Concerning its intimate organization we have nothing farther to ſay than what the reader will find in the general account of the ſerous membranes.

The arteries and veins of the pleuræ, beſides what have been already mentioned as belonging to the mediaſtinum, are derived chiefly from the intercoſtal veſſels. The abſorbents are exceedingly numerous, and paſs through glands ſituated about the heads of the ribs to the thoracic duct.

The internal ſurface of the pleura is in all parts ſmooth, pale, and covered by a ſerous moiſture produced from the exhaling veſſels of the membrane. This obſervation applies as well to the pleura pulmonalis, as to the p. coſtalis: the internal ſurface of the former conſtitutes the outer ſurface of the lung: the two portions of the membrane are contiguous at all points. In a living animal, or in one recently ſlaughtered, and opened whilſt yet warm, this ſerous exhalation eſcapes in the form of a light whitiſh ſmoke: the ſurface of the membrane has a ſoft ſlippery feel, but no actual fluid is diſcerned in the cheſt. When the body has cooled, this vapour is condenſed into a few drops of liquor, which is ſoon increaſed by the tranſudation through the blood-veſſels, and then it conſtitutes what authors have deſcribed under the name of liquor pleuræ. It has been queſtioned whether this, or the fluid of the pericardium, which is alſo in very ſmall quantity, compoſed the watery part of what iſſued from the ſide of our Saviour when pierced by the ſoldier. We are of opinion, that the period, at which this occurred after death, was too recent for us to ſuppoſe that any fluid, or if any, not more than an exceedingly minute portion of fluid, could be contained in the pleura or pericardium. Conſequently the fact does not admit of a natural explanation, but muſt be referred to the miraculous powers ſo ſignally exerted in other reſpects on this occaſion.

This ſerous exhalation is conſtantly abſorbed and renewed. It keeps the lung in an inſulated ſtate, and ſeparates it from the parietes of the thorax. How far this is eſſential to the functions of the organ, will be examined preſently.

The exhalation of the pleura is variouſly changed in diſeaſe. It conſiſts of actual fluid, either depoſited in unuſual abundance, or not abſorbed with the uſual activity, in hydro-thorax. In pleuritis it is the coagulating part of the blood, which afterwards forms the adheſions of the two pleuræ, ſo commonly ſeen in the dead body, that hardly any ſubject is entirely free from them.

As the pleura pulmonalis and coſtalis are always contiguous, it follows that the lung always fills the cavity of this membranous bag. If we diſſect away carefully the muſcular parts, that fill the interval of two ribs, ſo as to expoſe, without penetrating the pleura, the tranſparency of the latter membrane allows us to ſee the lung through it, and to ſee that there is no interval between them, but that they are in accurate contact in all parts of the cheſt. The reſult of this examination is the ſame, both in the living and the dead ſubject. From this repreſentation it follows that the motions of the cheſt muſt be accompanied by correſponding changes of the lungs; that air will enter into or paſs out of thoſe organs through the trachea, which is conſtantly open, according as the cheſt is enlarged or diminiſhed; and, in fact, that the dilatation and contraction of the thorax are conſtantly attended with a ſimilar dilatation and contraction of the lungs. Theſe motions of the cheſt refer entirely to the functions of the lungs, which are paſſive in reſpiration, which poſſeſs in themſelves no independent power of enlargement and diminution.

Different opinions were, for a long time, entertained on this ſubject; it was ſuppoſed that a ſpace filled with air, ſeparated the lungs from the containing cavity. A frequent and careful performance of the diſſection mentioned above, has however ſhewn the lung always in contact with the pleura, when the latter has not been injured; and the cheſt has been opened under water without a ſingle particle of air eſcaping. Indeed it is only by this contact that the function of reſpiration can be explained, if we admit the paſſive nature of the lung: the expanſion and contraction of the cheſt would be no longer attended with enlargement and diminution of the lung, if air were contained between this viſcus and the ſides of its containing cavity.

All the preceding obſervations apply to the natural ſtate of the parts, in which the bag of the pleura is entire; if that be wounded, ſo as to make a communication between its cavity and the external air, the lung no longer continues in contact with the ſides of the cheſt. It has been almoſt univerſally received, that when an opening is made into the thorax in the living ſubject, the lung falls from the ſides of the cavity, becomes diminiſhed in ſize, or, in technical language, *collapſes*, and remains motionleſs. Such is the repreſentation given by Haller (Element. Phyſiol. lib. viii. ſect. 2. § 6.) If an extenſive wound be made on both ſides, it ſeems generally admitted that the lungs are rendered motionleſs, that reſpiration ſtops, and the animal dies. But it is not equally clear that a ſmall wound is attended invariably with collapſe and a fatal termination. Caſes are recorded, in which penetrating wounds of the cheſt have been attended with protruſion of the lung—a ſtate apparently the direct reverſe of collapſe. And Mr. Norris, who had met with ſuch an inſtance, opened the thorax in ſheep, on one and both ſides, ſufficiently to enable him to introduce a finger. Reſpiration was not rendered difficult. (See Memoirs of the Med. Soc. of London, vol. iii.) Thus it ſhould ſeem that the ſize of the wound influences the reſult of the experiment in a living animal; which is not irreconcileable to the repreſentation we have already given of the paſſive ſtate of the lung. For the ſurface expoſed to the external preſſure of the atmoſphere by a ſmall wound may not counteract the effect produced by the contact of the two pleuræ in the whole of the reſt of their extent. In all theſe experiments the wound ſhould be carefully kept open, if we are to derive any inſtructive inferences from the reſult: if its ſides are allowed to come in contact, no collapſe of the lung could be expected. We do not know how to explain the protruſion of the lung from wounds.

If a wound be made in the lung, when there is no communication between the thorax and the external air, as by a broken rib, air eſcapes into the thorax, and cannot paſs out: a collapſe of the lung is a neceſſary conſequence. This is what occurs in emphyſema, and occaſions the difficulty in breathing; the air alſo eſcapes through the wound of the pleura into the cellular ſubſtance of the body.

When a wound is made into the cheſt, in the dead ſubject, the lung, which was before in contact with the pleura, immediately recedes from it. The ſeparation is more marked in front, leſs at the ſides; and at laſt the lung, much diminiſhed in volume, lies againſt the back of the cheſt. Of courſe an empty ſpace is left, proportioned to the collapſe of the lung, and the pleura is ſtretched over this, with a whitiſh opaque appearance. This experiment never fails, except when the lung is adherent. The air contained in the cheſt at the time of death is cooled as the reſt of the body grows cold; its volume muſt be diminiſhed, and the lung containing it muſt undergo a correſponding diminution, by virtue of its contractility of tiſſue. Hence a tendency to the formation of a vacuum enſues, in conſequence of which the preſſure of the external air puſhes the diaphragm ſtrongly upwards, and makes it very concave towards the abdomen. This is the condition in which that muſcle is conſtantly found in the dead ſubject, although we might ſuppoſe that the weight of the thoracic contents, preſſing on it above perpendicularly, would drive it downwards when it is no longer ſupported by the abdominal viſcera below. If a ſmall opening be made in it penetrating the cheſt, it immediately ſinks, and a ſpace is created above it by the atmoſpheric air entering the cavity.

How is the collapſe of the lung in the dead ſubject to be explained? Are we to conceive that air eſcapes through the glottis when the lung ſinks in conſequence of an opening in the cheſt? On this ſuppoſition the organ muſt previouſly have been maintained by its contact with the ſides of the cavity, in a ſtate of greater diſtention than it would exhibit if left to itſelf. The acceſs of the air to the thorax enables the lung to paſs into its natural ſtate, by allowing its contractility of tiſſue full ſcope for exertion. But we have aſcertained that the phenomenon, called collapſe of the lungs, takes place in the dead body, when a ligature is placed on the trachea, ſo that the contractility of tiſſue cannot operate. It depends entirely on the ſinking of the diaphragm, which gives way towards the abdomen, and is followed by the lung. The latter organ therefore is not diminiſhed in ſize, and cannot with any propriety be ſaid to have ſuffered collapſe. Let it be remembered that the concavity of the diaphragm is maintained by the preſſure of the atmoſphere, forcing it into the cheſt, to fill the ſpace left by the gradual diminution of volume of the lung conſequent on the cooling of the air, and its contractility of tiſſue; and that this ariſes entirely from the accurate mutual contact of the lung and thoracic cavity. When the latter is expoſed, the air preſſes on the lung at the ſituation of this expoſure above, as much as it does againſt the diaphragm below, and theſe two organs conſequently take that poſition which their weight and connections, independently of any other cauſes, would determine. We believe that the contractility of tiſſue of the lung has been exerted nearly to its full extent, before the cheſt is opened, and that it would be exerted to the utmoſt extent, if the diaphragm could be forced up ſufficiently to fill all the ſpace left by the contraction of the organ. It ſeems to us that the lung does contract after the cheſt has been opened, and conſequently that the diaphragm is not capable of filling all the ſpace which the contractility of the lung might leave. Bichat refers the collapſe of the lung in the dead ſubject entirely to the cooling of the air contained in this organ after death. This, he ſays, produces a vacuum between the lung and the pleura coſtalis; the lung collapſes before the cheſt is opened, becauſe the air-cells contract in proportion as the air is condenſed. The aſſertion that a vacuum exiſts is contrary to all obſervation; indeed the thing is obviouſly impoſſible. If we underſtand him rightly, he denies that the collapſe takes place on opening the cheſt. "Thus," ſays he, "there is this difference between opening a dead and a living body: in the former the lung has already collapſed; in the latter it collapſes at the inſtant of the opening. The contraction of the cells, when the cooled air is condenſed and occupies leſs ſpace, is an effect of the contractility of tiſſue, which remains in the organs to a certain degree after death. Moreover, if the lung collapſed in the dead body at the moment of opening the cheſt, the cauſe would be in the preſſure of the external air, which would expel through the trachea what was contained in the organ. But if, in order to prevent the exit of the air, you cloſe the trachea, and then open the cheſt, the lung is found in the ſame ſtate of collapſe; therefore the air had quitted it already. Make the ſame experiment on a living animal, and you will always prevent the collapſe of the lung." Recherches ſur la Vie et la Mort, p. 193, note 1.

It remains for us to advert again to the ſerous ſecretion which moiſtens the ſurface of the pleura. Is this ſecretion neceſſary to the phenomena of reſpiration? is that function ſenſibly impeded, when the ſerous fluid is no longer produced, and the pleura pulmonalis and coſtalis are united together throughout? For a long time the affirmative of this queſtion has been maintained, and it has even been uſual to attribute habitual difficulty of breathing to adheſions between the lungs and pleuræ. Yet the following conſiderations render this ſuppoſition very doubtful. 1. It has been clearly proved, that in the healthy ſtate the lungs and the containing cavities are perfectly contiguous, both in inſpiration and exſpiration: reaſoning alone might have ſhewn this. What end do the movements of the cheſt ſerve, if the lungs poſſeſs in themſelves an independent power of motion?

Since, then, the lungs and cheſt always move together, how can there be an empty ſpace between them? and if there can be none, how can an accidental union obſtruct the motions? 2. Adheſions between the pleura pulmonalis and coſtalis are extremely frequent. They are found, not only in individuals who have died after a long diſeaſe, but alſo in thoſe whom a violent death has ſurpriſed in a ſtate of health. In many inſtances the whole ſurface of the lung adheres to its cavity: yet in general the individuals have enjoyed perfect freedom of reſpiration. We muſt therefore conclude, that a continuity of ſurface between the lungs and cheſt does not injure the freedom of the reſpiratory functions. The utility of the ſerous fluid does not then appear ſo clear to us in the pleura, as in other cavities of the body. In the reſpiratory apparatus, the motions of the ſides of the cavity and of the contained organs hold a certain neceſſary and invariable relation to each other. The brain tends to move in an immoveable bony caſe; the gaſtric viſcera may change their poſition and relations to each other, without any alteration in the abdominal parietes: in the ſynovial cavities there are two ſurfaces conſtantly moving in an inverſe direction to each other, &c. We every where ſee the different portions of a ſerous ſurface ſliding on each other in a more or leſs marked degree, and we naturally conclude that the preſence of a fluid is indiſpenſible to that motion. The thorax alone preſents to us two ſerous ſurfaces always in contact at the ſame points.

The *two lungs* occupy the ſerous cavities on the ſides of the cheſt, lined, as already deſcribed, by the pleuræ. They are ſeparated from each other by the mediaſtinum, but united by the circumſtance of their receiving from two common trunks (the trachea and pulmonary artery) the air and blood which are neceſſary to their phenomena. They are not ſymmetrical, but differ both in ſize and form, exhibiting the irregularity which belongs to the organs of the organic life; or rather holding a middle place in this reſpect, as well as in their functions, between thoſe and the organs of the animal life. The heart, which is turned to the left, and placed almoſt entirely on the left ſide of the cheſt, diminiſhes the tranſverſe diameter of the correſponding pleura: the liver elevates the diaphragm very ſenſibly on the oppoſite ſide, ſo as to reduce the perpendicular meaſurement of the right pleura. Hence the left lung is the longeſt, and the right the broadeſt of the two.

Their volume, in the natural ſtate, is always exactly the ſame as the capacity of the bags of the pleuræ: their external ſurface is conſtantly in contact with theſe cavities. As they have no power of motion in themſelves, and follow every change which the ſides of the cheſt undergo, their capacity is conſtantly varying: when the cheſt is enlarged, they are dilated by the entrance of air into their ſubſtance through the trachea, and when it is contracted, they undergo a correſponding diminution by the expulſion of air. For further explanation and proofs on this ſubject, ſee the account of the pleura. Yet we cannot always judge of the volume of the lungs by the apparent extent of the pectoral cavity: the heart differs conſiderably in ſize, and ſimilar variations of the liver, influencing the height to which the diaphragm aſcends, are ſtill more common. The collapſe of the lungs, which we have conſidered in ſpeaking of the pleura, is leſs marked when theſe organs are diſtended with blood: it is generally leſs in children than in adults, and does not take place at all in the converſion of theſe organs into a ſolid maſs like the liver, at leaſt in the parts immediately affected. Thus the bulk of the lungs depends more on the fluids which they contain, particularly the blood and air, than on their ſolid ſubſtance. They are dilated in inſpiration; but ſtill thoroughly penetrated with air in the moſt complete exſpiration. Long and continued compreſſion or extraction of the air by an exhauſting ſyringe reduces them to ſo ſmall a bulk, that they do not equal one-fourth of the cavity which is deſigned to contain them. Preternatural accumulations of fluid, as water or pus, diminiſh the ſize of the organs in the ſame way during life. The moſt numerous inciſions and the ſtrongeſt preſſure will hardly get rid of all the air from the lungs: if we cut a very ſmall portion, and ſqueeze it moſt forcibly, there is ſtill enough air to keep up the ſize beyond what the ſolid matter would cauſe, and it ſtill ſwims in water. In ſhort, this air can be completely got rid of only by ebullition, maceration, or means that entirely deſtroy the texture of the organ.

The lungs generally contain more blood after death than during life, as an accumulation takes place in their veſſels in the act of dying: the quantity of this fluid influences the bulk of the organ, when the cavity of the cheſt is expoſed. When there is much blood, inciſions into the lung produce a leſs marked diminution of volume than we might expect: they only give iſſue to the air and not to the blood. The ready eſcape of the air, too, requires a free communication of the air-cells with each other, which the ſtagnation of the blood prevents, by confining the air in every part, ſo that only the cut portion is evacuated by the inciſions. Where the individual has died of hemorrhage, the lungs are almoſt entirely free from blood, and owe their volume to the air: here ſuperficial inciſions produce a ſudden and marked collapſe. This has been particularly obſerved in perſons executed by the guillotine: three or four inciſions have ſpeedily reduced the lung to nearly the half of its original ſize. (Bichat, Anat. Deſcript. t. iv. p. 12.) For the ſame reaſon, the degree of collapſe of the lung will be much influenced by the quantity of mucous fluids contained in the air-veſſels and cells of the lungs.

The lungs are the lighteſt organs in the body; they conſtantly ſwim when immerſed either entire, or in parts, in water. This property depends obviouſly on the ſame cauſe as their volume, namely, the air which they contain. When entirely deprived of this fluid, and reduced to their own ſubſtance, they do not ſwim. This is ſeen when one of them is ſo compreſſed and flattened by the effuſion into the cheſt of a large quantity of fluid, as to ſerve no longer for the purpoſes of reſpiration. In certain diſeaſes, too, the lung is rendered ſolid and impervious to air, and then ſinks in water; but this is a pathological phenomenon. Immerſion in water is, therefore, the ordinary and beſt method of determining the ſpecific gravity of the lung. The greater or ſmaller quantity of blood which may be contained in their veſſels at the time of health occaſions them to vary in weight when compared in different ſubjects.

There can be no doubt that the lungs of a perſon, who has died of aſphyxia, are heavier than thoſe of one who has periſhed from hemorrhage: and that theſe organs will be lighter after a chronic diſeaſe, which has exhauſted the vital powers, and diminiſhed the energy of the circulation, than after ſtrangulation, in which there is a conſiderable afflux of blood into them to the laſt moment.

The form of theſe viſcera is in general conical, with the baſis downwards, and the apex upwards. This form is tolerably conſtant, becauſe it depends on that of the thorax, which varies little in its natural ſtate. They correſpond immediately to the ſolid ſides of the cheſt only at the upper and outer parts: on the inner ſide they lie againſt the heart, and below are ſeparated from the abdominal organs by the diaphragm: in the two latter aſpects, therefore, their form is influenced by that of the neighbouring parts. The heart, placed chiefly on the left ſide of the cheſt, leaves a much narrower ſpace for the baſis of the left than for that of the right lung. The natural or accidental varieties in the form of the cheſt, as curvatures of the ſpine, with the concomitant deviations in the figure and direction of the ribs, are always attended with correſponding varieties in the lungs. We may deſcribe in each lung, beſides the baſis and apex, two ſurfaces, an internal and external.

The external ſurface is convex in its whole extent, and correſponds to the thoracic parietes, from which it is ſeparated by the pleura coſtalis; it is ſmooth and poliſhed, and lubricated by a ſerous exhalation. A conſiderable groove is obſerved in it, beginning behind a little below the apex, and running obliquely forwards and downwards to the baſis. This groove runs throughout the ſubſtance of the lung, which it divides into two nearly equal halves called lobes: theſe are connected together at the root of the organ by the reflexion of the pleura, and by receiving their blood-veſſels from a common trunk. The two lobes are in contact with each other by broad and flat ſurfaces, which are ſmooth and lubricated, like the external ſurface of the lung, as they are covered throughout by the pleura. The upper lobe of the right lung is marked by another groove, directed obliquely from above downwards, and within outwards; ſo that its maſs is divided into three lobes: the middle is the ſmalleſt, and triangular in its figure. This ſecondary groove is more variable than the former in its exiſtence, its length and depth. Sometimes, but very rarely, it is not found; and it is often incomplete, ſo as not to divide the middle lobe entirely from the ſuperior. It is very ſeldom ſeen in the left lung.

The internal ſurface is nearly plane, and divided into two unequal portions by the inſertion of the bronchi and pulmonary veſſels, which takes place towards its upper and back part.

It is at this point, which is called the root of the lung, that the pleura is reflected over the organ: here, therefore, the pleura pulmonalis and coſtalis are continuous. This is the only ſituation in which the lung adheres to the containing cavity; the ſurface is free and unattached every where elſe: it is ſometimes called, from this circumſtance, the ligamentum pulmonis.

The bronchus, the pulmonary artery and veins, the nerves and lymphatics of the organ, ſurrounded and connected by cellular ſubſtance, and forming a ſingle large faſciculus, paſs out of the mediaſtinum to the lung. The pleura is reflected over this faſciculus, covers it, and is continued over the lung. That portion of the inner ſide of the lung which is behind the root is narrow, and correſponds to the lateral ſurface of the vertebral column: the anterior diviſion is broader, and is contiguous to the heart and pericardium; it is ſlightly concave at this part. Above and below the inſertion of the veſſels the inner ſurface of the lung is not divided into theſe two parts.

The external and internal ſurfaces of the lung are united by two edges. The anterior is thin, particularly below, irregular in its outline, directed obliquely downwards and forwards, and has in the left lung a ſmall notch correſponding to the apex of the heart. The poſterior is obtuſe, not clearly marked, directed vertically, and correſponding to the hollow at the angles of the ribs. On the latter is ſeen, above, the commencement of the great groove, which divides the lung into two lobes.

The baſis of the lung reſts on the diaphragm, and is concave, to ſuit the convexity of that great muſcular partition. It is directed obliquely from within outwards, from above downwards, and from before backwards; correſponding in this reſpect entirely to the diaphragm. The concavity of the baſis is more marked in the right than in the left lung, on account of the greater convexity of this ſide of the diaphragm produced by the liver. The termination of the great groove is found on this ſurface of the organ, ſo that the two lobes are diſtinct here as well as in other ſituations: but the ſuperior lobe contributes to the formation of the baſis only in a very ſmall part of its extent, particularly on the right ſide. The circumference of the baſis preſents a thin edge, with a rather irregular outline interpoſed between the ribs and the diaphragm, near the attachment of the latter. This is more ſenſible on the right than on the left ſide.

Its appearance varies according to the different ſtates of the lungs; the preceding deſcription applies to the dead ſubject. In inſpiration, the diaphragm deſcends and becomes nearly plane; the lung follows it, and aſſumes a correſponding figure, its edge, inſtead of being thin, becoming thick, and no longer included between the diaphragm and ribs.

The apex of the lung is ſmall and obtuſe, and correſponds to the cul-de-ſac of the pleura under the firſt rib. In this way it is completely inſulated from the lower part of the neck. It exhibits ſeveral more or leſs marked tubercular riſings.

The whole ſurface of the lungs is unconnected to the cavity, except in the ſituation of the ligamenta pulmonum. The oppoſed ſurfaces of the lobes are in the ſame way unconnected to each other, and covered by the ſerous membrane. All theſe parts are moiſtened by a ſerous exhalation.

The colour of the lungs, when not influenced by that of the fluids which they contain, is extremely pale; ſometimes a ſlight tawny brown, but more frequently grey or aſh-coloured; and ſometimes completely white. This colour is ſeen over the whole organ, both on its ſurface, and in the interior, when it is quite free from blood; but is no longer viſible when the lung is loaded with that fluid. Hence we underſtand why we meet with it ſo ſeldom in the dead body, ſince a diſtention of the pulmonary veſſels with blood is one of the moſt ordinary phenomena of death. The only caſes in which we can expect with ſome certainty to find the lungs exhibiting this pale colour throughout, are thoſe of deaths from hemorrhage. It was noticed by the French in individuals who periſhed by the guillotine. We may often obſerve it in ſome particular points of the organ, where the abſence of blood may be aſcertained by inciſions. The tawny or greyiſh colour of the lungs is interrupted by ſmall black or brown ſpots, irregularly diſſeminated over the ſurface, and very variable in number and form. Often the organ is very thickly ſpotted in this way; at other times they are ſcattered here and there at conſiderable diſtances; ſometimes, but very ſeldom, they do not exiſt at all. Theſe ſpots do not depend in the leaſt on the blood. Simple inſpection is ſufficient to prove that they belong to the organization of the part. They are very diſtinct in the paleſt and moſt bloodleſs lungs, and may be eaſily recogniſed in the general livid tint of thoſe which are moſt loaded; they ſeem to poſſeſs always the ſame intenſity of colour; and they are always circumſcribed, while the marks ariſing from the blood end imperceptibly. Theſe black ſpots preſent every variety of figure. Some are ſuperficial, others extend into the ſubſtance of the lung, and ſome are found in the interior of the organ. They ſeem to belong entirely to the pulmonary tiſſue, as they are never ſeen on the bag of the pleura, and are found in the ſubſtance of the lung.

But generally the lungs are loaded with blood at the time of death, and do not conſequently exhibit the paleneſs which we have deſcribed as belonging to their proper tiſſue. They are uſually livid, violet-coloured, browniſh, or reddiſh; and the mixture of theſe various tints gives them the marbled appearance, which has generally been regarded in diſſecting rooms as the natural ſtate of the organs, although it is merely produced by death. The brown, blueiſh, or violet colour is the moſt frequently obſerved, and occupies the lung moſt extenſively. It depends on the preſence of venous blood, which ſtagnates as ſoon as reſpiration has ceaſed to colour what the right ventricle ſtill impels. The tint varies as the blood is accumulated more or leſs in particular ſituations. The higheſt degree of this congeſtion produces the black obſerved in the lungs of thoſe who die of aſphyxia; the brown or violet colour is cauſed by a ſlighter degree of the ſame effect. The colour is always the deepeſt in the moſt depending part of the lung, as the blood, obeying only the laws of gravity after death, ſettles in the loweſt parts. From the ordinary poſition of the body this deep colour is uſually ſeen at the back of the lung; but if the ſubject be laid on the face, the ſame phenomenon is exhibited in front. Theſe dark colours are not the only ones obſerved in the lungs; more or leſs extenſive patches of a bright red are often ſeen; this may occupy a large portion of the organ, while the reſt is brown or violet-coloured. This red colour is univerſal in the lungs of children, which do not preſent the black ſpots; the former gradually diſappears, and the latter increaſe with the progreſs of age. The ſame bright tint extends into the ſubſtance of the lung. We are at a loſs for a ſatisfactory explanation of this appearance: if it aroſe from the blood being acted upon after death, by the air contained in the pulmonary air-cells, we ſhould expect to find it more univerſal and more frequent. The parts of the lung, however, in which this tint is obſerved, certainly contain ſcarlet blood, and owe the colour to that.

The lungs are the leaſt denſe, and leaſt reſiſting of all organs formed of ſolid tiſſues. They yield readily to compreſſion, preſerve the mark of the preſſure, and are reſtored imperfectly to their original ſtate. This obſervation applies only where they are not loaded with blood, but contain merely that quantity of air, which never leaves them after they have been once diſtended with it. When full of blood, they acquire a conſiſtence foreign to their own ſubſtance, reſiſt preſſure more effectually, and reſtore themſelves more readily. Hence ſoftneſs and flaccidity more particularly characterize the lungs of perſons who have died of hemorrhage. When we ſqueeze the air forcibly into a part of the lung, a peculiar crackling noiſe is produced by the burſting of the air-cells: this crepitation does not take place in diſeaſed lungs.

The ſoftneſs of the pulmonary texture ariſes from the lungs being entirely compoſed, as we ſhall ſee preſently, of various vaſcular ſyſtems. It accords very perfectly with the paſſive part that they perform in the reſpiratory phenomena: poſſeſſing no power of motion in themſelves, they expand and contract merely in conſequence of motions of the cheſt.

The lungs are compoſed of a cartilaginous and membranous tube, by which air is conveyed into them; of the pulmonary artery and veins, of which the former terminates the ſyſtem of black blood, and the latter commence that of red blood; of the bronchial veſſels concerned in the nutrition of theſe organs; of a peculiar tiſſue, compoſing a congeries of minute cells, which receive the air admitted in reſpiration; and of lymphatics and nerves. Theſe parts are all united by cellular tiſſue, and covered externally by the reflected pleura.

The air-veſſels compoſe the eſſential part of the lungs, with reſpect to their functions as organs of reſpiration. They introduce the fluid by which the blood is changed; this proceſs goes on at their ſurface; and the air, after ſerving the purpoſes of reſpiration, is expelled through them. When taken altogether they form the cavity of the reſpiratory apparatus, which is analogous to that of the digeſtive canal, in having a mucous lining, but differs in its arrangement, as it is ſubdivided into a vaſt number of canals, decreaſing ſucceſſively like arteries. Theſe are the only tubes in the body conſtantly open; it is neceſſary that the air ſhould have free and conſtant acceſs to them. This order of tubes is begun by a ſingle trunk, which unites the two lungs, and neceſſarily renders their phenomena ſimultaneous. The common trunk is called trachea (aſpera arteria, trachée artère); and its primary diviſions the right and left bronchi.

The *trachea* is placed in front of the vertebral column, extends from the upper part and middle of the neck to the upper part of the cheſt, beginning immediately below the larynx, and ending about the level of the ſecond or third dorſal vertebra. It is placed on the middle line of the body, and is ſymmetrical in its whole extent; in this reſpect it approaches to the external organs: the ſymmetry ceaſes in its diviſions. It appears cylindrical in front, but is flattened behind. Its diameter varies according to the age of the ſubject, and the natural volume of the lungs; it may be about eight or ten lines in the adult, and is exactly the ſame with that of the larynx, meaſured at the cricoid cartilage. It continues the ſame through the whole length of the trachea.

In front it is covered above by the two portions of the thyroid gland, which unite together at the middle of the tube. Lower down the ſterno-hyoidei and ſterno-thyroidei, and the inferior thyroid veins cover it. In the cheſt it is encloſed in the poſterior mediaſtinum, and correſponds to the thymus, to the left ſubclavian vein, the arteria innominata, and the arch of the aorta. Behind it covers the œſophagus, and towards the right the vertebral column. On the ſides it is covered above by the lateral portions of the thyroid gland, and is contiguous below to the common carotids. A looſe and abundant cellular tiſſue forms the medium of its connection to all theſe parts. The ſuperior extremity is connected to the cricoid cartilage by a ligamentous ſubſtance; the inferior is placed at the right ſide of the deſcending aorta, is bifurcated, and produces the two bronchi. The latter begin about the ſecond or third dorſal vertebra, and ſeparate from the common trunk nearly at a right angle, yet they go with ſome obliquity, downwards and outwards, each to its correſponding lung. Here we begin to meet with the irregularity of form that characterizes the organs of the internal life. The left bronchus is ſmaller than the right, and takes a much longer courſe: it paſſes under the arch of the aorta, while the other goes immediately to its lung. Theſe tubes enter the lungs at the ſituations already deſcribed as the roots of thoſe organs. They ramify in every direction, and divide into branches, becoming ſucceſſively ſmaller and ſmaller. Theſe ſubdiviſions are ſo numerous, that every part of the lung contains them. The exact manner of their termination is not underſtood.

The air-tubes are compoſed of three parts, an exterior membrane, of a fibrous and probably muſcular texture; a cartilaginous ſtructure, which is united to the preceding; and a mucous lining. The exterior membrane riſes above from the circumference of the cricoid cartilage, and occupies the whole extent of the trachea and bronchi, forming a very eſſential part of thoſe tubes. It is tolerably thick in the greateſt part of its courſe, but grows thinner in the ſmaller ramifications of the bronchi, where it cannot be eaſily traced. It is formed of parallel and cloſely arranged longitudinal fibres, the nature of which is doubtful; ſome conſider them as muſcular, others regard them as a fibrous organ, to which their appearance is very ſimilar. This membrane alone conſtitutes the ſolid portion of the trachea behind; and hence ariſes the flattened figure of the tube at that part. This peculiarity in the back of the trachea has been referred to the ſituation and motions of the œſophagus, which lies cloſe behind it: but the ſame ſtructure exiſts in the bronchi alſo, where it cannot admit of that explanation. The arrangement is different on the anterior part and ſides of the trachea, in two-thirds at leaſt of the circumference of the tube. The fibrous membrane is interrupted by portions of cartilage (annuli cartilaginei), which keep it on the ſtretch, and thereby preſerve the air-tubes conſtantly open. Each of theſe cartilages repreſents two-thirds of a circle. They are bent on themſelves, flattened on their ſurfaces, uniform in length, but of different breadths. Their convexity forms a part of the exterior ſurface of the tube; their concavity correſponds to the mucous membranes, from which a thin cellular ſtratum ſeparates them. Their ſuperior and inferior margins are rounded, continuous on the outſide with the fibrous tiſſue, and ſlightly prominent through the mucous membrane on the inſide. Their extremities project more or leſs behind in the fibrous tiſſue, are all on the ſame level, are rounded, and a little bent upwards. They vary in number from about ſixteen to twenty; they may be more or leſs broad; and, as the length of the tube is nearly uniform, they muſt be more numerous in proportion as they are narrower. In general, they are broader in front, and diminiſh progreſſively to the back part: but the reverſe of this ſometimes happens; or two may be united at their edges. Commonly their direction is horizontal to the axis of the trachea; but many of them are often more or leſs oblique.

In colour and texture they reſemble the fibro-cartilages of the organs of ſenſe: they are very elaſtic.

The firſt cartilage is generally much larger than the ſucceeding ones; the laſt has a prolongation from its middle correſponding to the bifurcation of the bronchi.

In the ramifications of the bronchi the cartilages become leſs regular in their form, and fewer. They no longer exhibit that annular form, but conſiſt merely of ſmall pieces, ſometimes ſeparate, and ſometimes united. As the ſubdiviſions are multiplied, the cartilages become leſs firm, and at laſt diſappear altogether, ſo that we find only a membranous ſtructure when we have traced the air-tubes as far as the eye can go.

The external ſurface of this fibrous membrane is ſprinkled behind with ſmall lightiſh brown and flattened bodies of very variable figure, round, oval, &c. Theſe are mucous glands, of which the excretory ducts open on the internal ſurface of the tube. They are ſmaller on the bronchi than in the trunk of the trachea, and they become more minute in proportion as the veſſels ramify. Their ſtructure ſeems to be very ſimple; one duct comes from each gland generally; but ſometimes two or three glands are united, and there the ducts are more numerous. The fibrous membrane exhibits none of theſe glands in the intervals of the cartilages, on its external ſurface. The inner ſurface of the membrane, in the ſame ſituation, correſponds to the mucous lining of the tube, from which it is ſeparated by numerous ſmall and cloſely arranged granular bodies, which are probably mucous glands. At the back part of the tube there is found, under the fibrous membrane, a ſtratum of tranſverſe fibres extended between the extremities of the cartilages, to which they are attached. Theſe are diſpoſed in ſmall faſciculi, have not the white aponeurotic appearance of the fibrous membrane, and ſeem to be real muſcular fibres. They are connected to the mucous lining by a looſe cellular tiſſue, and may be moſt advantageouſly ſeen by diſſecting away that membrane from the inſide. In what manner theſe fibres affect the phenomena that occur in the trachea we do not know. The longitudinal ones, that compoſe the fibrous membrane already deſcribed, have generally been regarded as of a muſcular nature: but their appearance by no means warrants this repreſentation. They poſſeſs conſiderable elaſtic power, ſo that the trachea, when extended, recovers itſelf very quickly and completely: this property is frequently brought into exerciſe in the living ſtate from the motions of the head and neck. The effect of the cartilaginous ſemi-circles, which are incorporated with this membrane, in preſerving the air-tubes permanently open, and the neceſſity of this arrangement to the execution of the reſpiratory functions, are too obvious to require any detailed illuſtration.

The mucous membrane, or the third conſtituent portion of the air-tubes, is the ſecond diviſion of that great mucous apparatus, called by Bichat *gaſtro-pulmonaire*. We trace its continuation from the pharynx into the larynx, through that cavity into the trachea and bronchi, to their ultimate ramifications. In the latter, it is ſaid to exiſt alone, or without the other two parts already mentioned: but the minuteneſs of the parts makes it difficult to aſcertain this point by direct examination, although ſuch a ſtructure would be favourable to that more intimate connection between the blood and air-veſſels, which is neceſſary to the chemical phenomena of reſpiration, according to the notions commonly entertained reſpecting theſe phenomena. The external ſurface correſponds behind to the tranſverſe fibres; and in the reſt of its extent to the fibrous membrane and cartilages, which latter project through it. The connecting medium which attaches it to all theſe parts is a cellular ſubſtance, admitting eaſily of ſeparation. The internal ſurface is ſmooth, and conſtantly lubricated by a mucous ſecretion: it forms the cavity of the air-tubes. The excretory canals of the mucous glands open on it in many parts very diſtinctly. In the back of the tube, where there is no cartilage, it exhibits numerous prominent and regular longitudinal folds: theſe extend into the bronchi and their ramifications. They are not produced by the contraction of any parts ſituated exteriorly, but exiſt when the membrane has been detached, and are not affected by tranſverſe extenſion of the tube: they ſeem to ariſe from ſmall fibrous columns forming a part of the ſtructure of the membrane.

For the organization of this membrane, we muſt refer to the general view exhibited in the article MEMBRANE. It is thinner, leſs ſpongy and ſoft, and more firmly attached in the trachea than in the larynx: the orifices of the mucous ducts are alſo ſmaller; in the bronchi it is ſtill more delicate, and this thinneſs increaſes as the tubes divide. In the natural ſtate it is white, ſo as to indicate that the capillary ſyſtem is not very clearly marked in it. Theſe veſſels are developed and become perceptible under numerous circumſtances, particularly in catarrhal affections, to which the pulmonary mucous membrane is very ſubject. The blood is then accumulated in the capillaries, and gives to the membrane a red colour, which it does not poſſeſs naturally.

It is ſuppoſed that this membrane compoſes entirely the air-cells, or veſicles of the lungs, in which the minute ramifications of the air-tubes end. If we impel air into the trachea, the whole lung becomes diſtended, and increaſes in volume in proportion to the quantity of air inflated. Attentive obſervation will then convince us that its whole ſubſtance is compoſed of ſmall cells, which we can readily diſcern on the ſurface. If the inflated lung be dried, or if the organ be diſtended with ſpirit of wine, and then cut, its whole ſubſtance is found to be compoſed of theſe cells, as well as its external ſurface. Injection with quickſilver will demonſtrate the ſame ſtructure. This gives to the lung, when cut or torn, a porous and ſpongy appearance throughout. The cells, when attentively ſurveyed on the ſurface of the lung, have a roundiſh figure, but their outline is often irregular. When inflated they meaſure $\frac{1}{5}$th or [illegible]th of a line in diameter. They communicate together in all directions ſo completely, by the ramifications of the air-tubes, that air might paſs eaſily from a ſingle cell into all parts of the lung; but the cells of the neighbouring lobules do not ſeem to have any direct communication.

The mucous membrane, in an extremely delicate ſtate, continued from the minute ends of the air-tubes, is ſuppoſed to compoſe theſe cells; but the minuteneſs of the objects renders our deſcription of them, excepting a few general facts, rather uncertain. Anatomy diſcovers to us rather a ſpongy net-work, filled with air, and formed by blood-veſſels croſſing in every direction, than any clear arrangement of diſtinct cells, connected to the bronchial ramifications, like grapes to their ſtalk, as they have been deſcribed and drawn by ſeveral anatomiſts.

In this view of the ſubject, the extent of ſurface of the mucous membrane muſt be enormous. Many attempts have been made to expreſs it in numbers. Hales makes the air-cells $\frac{1}{100}$dth of an inch in diameter; the ſurface of the air-tubes equal to 1035 ſquare inches; and that of the air-cells to 20,000. Keil eſtimates the number of the veſicles at 174,418,615, and the whole internal ſurface of the lung at 21,906 ſquare inches. Lieberkuhn carries his eſtimate of the ſurface as high as 1500 cubic feet. We mention theſe circumſtances only to ſhew the great extent of the mucous membrane, and not becauſe we place much faith in their accuracy. In reading deſcriptions of the minute ſtructure of the lungs, and, indeed, in all other analogous parts of anatomy, we ſhould always bear in mind the obſervation of Haller; "Ea fere hominum eſt infelicitas, ut omnis ultima rerum phyſicarum hiſtoria parum firma ſit, et ut altera illa, rerum geſtarum memoratrix, in mythices fines terminatur."

A mucous fluid conſtantly lubricates the whole of this ſurface. It is limpid, mild, and nearly inſipid, or ſlightly ſaltiſh, and but little tenacious in the natural ſtate. When free from air, it ſinks in water. It is produced in ſo ſmall a quantity, that it ſeems to be diſſolved in the air, and thus to paſs off inſenſibly in exſpiration, or to be taken up by the abſorbents. It is poured out much more abundantly under various circumſtances, and is altered in colour and conſiſtence: it is then expelled by the expiratory efforts which conſtitute cough. In children it has a reddiſh colour; and it is often rather livid in adults.

The watery vapour diſcharged from the lungs in exſpiration concurs in lubricating the ſurface of the air-paſſages. Whether there be any exhalation from the general mucous ſurface, in addition to the mucous ſecretion, ſeems a point hardly ſuſceptible of poſitive determination.

The pulmonary mucous membrane is the part in which the chemical phenomena of reſpiration are carried on; its ſurface is in contact with the air taken into the lungs. The latter fluid is the only one, in addition to its natural mucus, of which it can bear the contact. All other ſubſtances, even the cleareſt water, are immediately and powerfully rejected by it. In itſelf it poſſeſſes no power of expelling any irritating matter from its ſurface; but it excites the expiratory muſcles which act convulſively and repeatedly until the cauſe is removed.

The veſſels and nerves of the lungs are principally diſtributed on the air-tubes, of which they every where follow the courſe. The arteries of the trachea come from the inferior thyroideal; thoſe of the bronchi are derived immediately from the aorta, and are called the bronchial arteries. The latter ramify in conjunction with the air-tubes, and adhere cloſely to them: they are diſtributed chiefly on the internal membrane. Several branches are ſpent on the bronchial glands, and on the parietes of the pulmonary veſſels. Do they anaſtomoſe with the pulmonary artery? We ſhould be inclined to ſuppoſe that they do not, from conſidering that the two kinds of veſſels contain blood of different natures, and have altogether different offices. The bronchial arteries convey arterial blood for the nutrition of the lung; the pulmonary artery takes the venous blood, that it may be ſubmitted to the action of the air in reſpiration. Yet it has been aſſerted by ſeveral anatomiſts, that ſuch an anaſtomoſis does take place. The bronchial veins accompany the arteries: their trunks end in the vena azygos on the right ſide, and in the ſuperior intercoſtal vein on the left.

The par vagum furniſhes nearly all the nerves belonging to theſe organs: thoſe of the trachea come from it altogether. The nerves of the bronchi are derived from the pulmonary plexuſes formed principally by the par vagum, but partly alſo by branches from ſome ganglia of the great ſympathetic. As theſe nerves ſeem to be diſtributed entirely on the air-tubes, perhaps the epithet bronchia would be more proper for them than pulmonary.

The vaſcular ſyſtem of the lungs may be divided into three parts, diſtinct in their nature, properties, and the immediate object of their phenomena. The firſt is the pulmonary artery, or the end of the general ſyſtem of black blood; the ſecond, the pulmonary veins, or commencement of the general ſyſtem of red blood; and the third, the capillary ſyſtem intermediate to the two preceding. (See Circulation and Heart.) The pulmonary artery ariſes from the upper and anterior part of the right ventricle, in front of the origin of the aorta. It paſſes upwards and backwards, lying cloſe on the left ſide of the root of the aorta, and, after a courſe of about an inch and a half, divides into a right and left branch deſtined for the correſponding lungs. Theſe two diviſions ſeparate moſt widely at their origin, going off from the trunk at right angles, and hardly forming a ſenſible angle with each other. The ſeparation takes place on the left ſide of the aorta. The right trunk goes immediately behind the aorta and ſuperior vena cava, and follows a tranſverſe courſe to the right lung; the left has an analogous courſe on the left ſide of the body, but is much ſhorter than the right, on account of the latter paſſing behind the aorta and vena cava. Both are placed in front of the bronchi, and croſs the courſe at firſt, being directed a little from below upwards; but they are ſubdivided exactly like the bronchi, and follow their courſe, being cloſely connected to them throughout: the artery is generally placed above its correſponding air-tube. For the organiſation of this veſſel, we refer to the article Heart.

The pulmonary veins, ariſing from the capillary ſyſtem, follow a courſe analogous to that of the arterial diviſions. Theſe alſo accompany the air-tubes, and are ſituated under them. They unite gradually into larger and larger tubes, and form ultimately four conſiderable trunks, two belonging to each lung, and terminating in the left auricle of the heart. The ſuperior right pulmonary vein paſſes out of the lung below the bronchus, and goes with a little obliquity downwards: the inferior aſcends obliquely towards the auricle. The left veins have a ſimilar arrangement; one deſcends, and the other aſcends: they are more approximated than on the

the right ſide. For the organiſation of theſe veſſels, ſee Heart.

The capillary veſſels of the lung are diſtributed in infinite number through all parts of the organ, of the proper tiſſue of which they compoſe a very conſiderable ſhare. As they have no connection with the nutrition of the part, and perform no ſecretion, they give paſſage only to the blood, and are hence remarkably diſtinguiſhed from the general capillary ſyſtem. Theſe veſſels cover in vaſt profuſion the air-cells of the lungs; ſo that when they are injected with coloured fluids after death, the whole ſubſtance of the organ appears dyed of the peculiar colour. In them the blood is expoſed to the air, and converted from the dark or venous into the red or arterial ſtate.

The ſubſtance of the lungs, on ſuperficial examination, offers a ſoft ſpongy maſs, yielding eaſily to preſſure, and reſtoring itſelf afterwards to its original ſtate in an imperfect manner. When we view it more attentively, we obſerve on the ſurface ſmall whitiſh lines circumſcribing ſpaces of different figures, as triangular, quadrangular, &c. Theſe are called lobules of the lungs, and vary conſiderably in ſize as well as figure. They are again divided into other ſmaller parts. Theſe lobules are all connected together by a looſe and ſoft cellular ſubſtance, which never contains any fat; and the ſame ſubſtance unites the reflected pleura to the external ſurface of the lung. If we tear the ſubſtance of the organ, and inflate it, the air fills the cells of this cellular texture, and makes it more ſenſible: it is alſo in ſome caſes rendered more obvious, by being the ſeat of a watery depoſition, which conſtitutes anaſarca of the lungs. Its cells have no communication with the air veſicles, unleſs the latter be broken by inflation, as when we ſqueeze the air in them forcibly, they crack, and the air eſcapes into the cellular texture, uniting the lobuli. On the other hand, we might inflate the cellular ſubſtance diſtinctly from the air-cells.

Each lobulus of the lung conſiſts of a branch of the air-tube with a correſponding proportion of cells, a branch of the pulmonary artery and vein, a portion of the pulmonary capillaries of the bronchial veſſels and nervous ramifications, connected by the cellular ſubſtance already deſcribed.

The lymphatics of the lungs are numerous, and divided into a ſuperficial and deep-ſeated ſet: the former conſtitute a net-work on the ſurface of the lung, and communicate alſo with the latter. They paſs through numerous glands, called bronchial, placed on the trunks of the air-tubes and blood-veſſels, partly within, but chiefly without the ſubſtance of the lung. Other larger glands are ſituated about the diviſion of the trachea, and the abſorbents of the right and left lung communicate in them. Some abſorbents of the right lung terminate in the right abſorbent trunk; the reſt, with thoſe of the left, end in the thoracic duct, paſſing through glands on the ſpine.

The bronchial glands are large in ſize, and numerous in proportion to the lung; but they vary in both theſe reſpects in different ſubjects. Several of the ſmalleſt are found on the bronchi, within the ſubſtance of the lung. Their colour is the moſt remarkable of their properties: in the adult it is a deep livid or black. Their conſiſtence is rather ſoft, and a coloured fluid may be expreſſed from them, when cut or divided. It is now clearly aſcertained that theſe bodies belong to the lymphatic ſyſtem. Anatomiſts formerly conceived that they ſecreted a particular fluid, and poured it into the bronchi. We are quite ignorant of the cauſe of their peculiar black colour.

The lung, then, is made up of the tiſſues juſt deſcribed, covered on the ſurface by the very thin and tranſparent pleura pulmonalis, which is connected to the organ by cellular ſubſtance, and gives it the ſmooth external ſurface.

Developement of the Lungs.—The fœtus has no reſpiration: from the circumſtances under which it is placed in the uterus, it muſt obviouſly be altogether precluded from exerciſing that function; but it begins immediately after birth: hence the lungs, formed nearly as ſoon as the principal organ of circulation, poſſeſs, at a very early period, a conſiderable developement and well-marked form. Their organiſation, too, is perfect, or at leaſt they are capable of executing their functions, before the time at which they naturally come into action: for there are inſtances of children born long before the end of the ninth month, as, for inſtance, at the ſeventh, or even ſooner, who have been preſerved alive by great care. In the early periods their colour is reddiſh; they then aſſume a ſlightly tawny hue, which is continued till the time of birth, and is not even changed by reſpiration, although the admiſſion of air into the organs at that time is followed by the entrance of a larger quantity of blood.

The lobuli are very diſtinct in the fœtus, and eaſily ſeparable: the connecting ſubſtance appears to be more copious. Although the lungs are ſmall in a fœtus at full time, compared to thoſe of a child who has breathed, we cannot ſay, as ſome anatomiſts repreſent, that they are extremely diminutive, and confined to the back of the cheſt. As they are at this time entirely free from air, they poſſeſs a denſity, which makes them ſink inſtantly in water, when plunged into it either entire or in ſlices. They are penetrated by much leſs blood than after breathing has begun, and therefore reduced almoſt entirely to their ſolid and organiſed contents: they form at this time about $\frac{1}{70}$th of the weight of the whole body.

As the function of reſpiration, which commences at the moment of birth, goes on afterwards uninterruptedly, and as the phenomena are as regular and perfect at this time as in more advanced age, we have no reaſon to expect that the intimate ſtructure of the organ, that is, the arrangement of the different component tiſſues, will be different at that age from what we know of it in the adult: but the vaſcular trunks belonging to theſe parts exhibit ſome peculiarities, of which the details will be found in the articles Heart and Circulation.

Breathing begins immediately after birth; the enlargement of the cheſt occaſions the lungs to be diſtended with air, and conſequently to become ſpecifically lighter; a greater quantity of blood paſſes through them, and thus they acquire greater abſolute weight. The increaſe of volume muſt be limited by the capability of enlargement in the cheſt; and this cannot be very conſiderable immediately on birth. This enlarged ſize is not, therefore, ſufficiently marked, to be relied on as a proof that reſpiration has begun. It is a well-known fact, which we have already ſtated, that the lungs of an individual, who has breathed, ſwim in water, whether they be immerſed entire or in ſlices. This is a property remarkably contraſted with what takes place under the ſame treatment before birth. A criterion has been ſought for in this ſource, to determine, in doubtful caſes, whether a child has been born dead or alive: and the conſideration is a highly important one, from the influence it may produce on medical opinions, in caſes of ſuſpected child-murder. We ſhall only obſerve here, that the convulſive attempts to eſtabliſh reſpiration, although not ſucceſsful, may introduce air enough into the lungs to make them buoyant in water; that attempts to inflate them, in order to preſerve the child, or after it has died, may have the ſame effect; that the diſengagement of air by putrefaction

tion may thus make them ſpecifically lighter than water; not to mention, that the child may have breathed and died afterwards: ſo that the mere naked circumſtance of the lung ſwimming is altogether an inſufficient proof that the child has been murdered; and to condemn a mother to death on ſuch grounds, exhibits a degree of ignorance and barbarity worthy only of the dark ages.

The increaſe of abſolute bulk in the lungs after birth is a phenomenon very worthy of being remarked. We have ſtated already, that theſe organs in the fœtus, at full time, are $\frac{1}{70}$th of the body. According to the reſearches of ſome German and French anatomiſts, they are no more than $\frac{1}{35}$th, or $\frac{1}{37}$th in a child who has breathed. There may be ſome variation in this point, but the organs are never ſo light as to approach at all to the proportion which they exhibit before birth; a fact which is highly important in its application to queſtions of ſuppoſed infanticide.

The colour of the lungs does not remain through life the ſame as at the time of birth. In the earlier years it has ſtill the reddiſh, mixed with a tint of yellow, which we have already mentioned. After the twentieth year the livid or black ſpots appear, and become more numerous as age advances.

Phyſiology of the Lungs.—Two very different kinds of phenomena take place in the lungs. The firſt are entirely mechanical, and relate to the motions of the ſides of the cheſt, by which the cavity is enlarged or diminiſhed; and to the dilatation or contraction of the air-cells, and the admiſſion and expulſion of the air, which are conſequent on theſe motions. Theſe have been already conſidered in thoſe parts of the preſent article which relate to the motions of the thorax. The phenomena of the ſecond kind are purely chemical, and conſiſt of the various alterations which the reſpired air undergoes, of the changes effected in the compoſition of the blood, &c. For an account of theſe, the reader is referred to Respiration, and Heat, *Animal.*

Theſe two diviſions of the reſpiratory phenomena belong reſpectively to the two great claſſes of vital proceſſes; the animal and organic. The motions of the cheſt are performed by voluntary muſcles, and conſequently are ſubject to the influence of the brain: hence a ſection of the medulla ſpinalis above the origin of the phrenic nerve, or a diviſion of the nerves which ſupply the muſcles of reſpiration, immediately annihilates theſe motions. Commonly, indeed, the motions of the cheſt are performed ſpontaneouſly, that is, without any exertion of the will; and they go on during ſleep, when the action of all voluntary organs is ſuſpended. But an act of the will can accelerate, retard, or otherwiſe modify the movements of the cheſt; and many of the muſcles concerned aſſiſt in moving the trunk, on occaſions that have nothing to do with reſpiration. The changes of the blood, on the other hand, go on in the capillaries, and are performed without our conſciouſneſs: the brain has no influence on them. The reſpiratory functions, then, offer the point of union of the animal and organic lives, in which theſe may reciprocally influence each other.

The chemical and mechanical phenomena of reſpiration are in a ſtate of mutual dependence: the interruption of one is always quickly followed by the ceſſation of the other. Without the former, the latter would have no materials to act upon. If the mechanical phenomena were interrupted, the blood would no longer be fit to excite the brain; and that organ could not influence, in the proper manner, the intercoſtal muſcles of the diaphragm: hence theſe muſcles would become inactive, and even the mechanical phenomena muſt ceaſe.

The heart does not influence theſe two kinds of phenomena in the ſame way.

The heart of black blood has obviouſly no power over the mechanical phenomena of the lungs; but it is eſſentially concerned in producing the chemical phenomena, as it ſends to the organ the fluid which derives certain properties from the air, and imparts others to it. Thus, when the functions of the auricle or ventricle of black blood, or of the great venous trunks, are interrupted, as by a wound, or a ligature applied in experiments, the chemical phenomena are at once annihilated; but the dilatation and contraction of the cheſt ſtill goes on. No blood arrives at the left ventricle, and conſequently the requiſite motion cannot be imparted to the brain: hence its functions are ſuſpended, and conſequently the intercoſtal muſcles and diaphragm ceaſe to act.

In the caſe of a wound affecting the auricle or ventricle of red blood, the aorta, or its great branches, when a ligature is artificially applied to the latter, or an aneuriſm burſts, &c. the functions of the lungs ceaſe in the following order: 1. No more impulſe communicated to the brain; 2. No more motion of that organ; 3. No more action exerted on the muſcles, and conſequently no more contraction of the intercoſtals and diaphragm; 4. No more mechanical phenomena. Without the latter, the chemical phenomena cannot take place: in the foregoing caſe, they were ſtopped for want of blood; in this, they ceaſe from the interruption in the ſupply of air.

The preceding obſervations are derived from the Recherches Phyſiologiques of Bichat. In the 6th, 7th, 8th, and 9th articles of the ſecond part of that work, he has entered at length into the conſideration of the influence of the lungs on the heart, the brain, and the organs of the body in general; of which ſubjects he has given more clear and connected views than any other phyſiologiſt. We ſhall, therefore, avail ourſelves of his labours in this concluding diviſion of the preſent article.

Influence of the Death of the Lung upon that of the Heart.—The ceſſation of action in the lungs may begin either in the mechanical or the chemical phenomena. A wound expoſing them extenſively on both ſides of the cheſt, and producing their ſudden collapſe; a diviſion of the ſpinal marrow ſuddenly paralyſing the intercoſtal muſcles and diaphragm; are caſes in which the death of the lungs begins in the mechanical phenomena. It commences in the chemical, in aſphyxia from noxious gaſes, from ſtrangulation, ſubmerſion, expoſure in vacuo, &c.

The heart's action can be interrupted by the ceſſation of the mechanical phenomena of the lungs only in two ways: 1. Directly, if the blood meets in the lungs with a real mechanical obſtacle to its circulation; 2. Indirectly, becauſe where the mechanical action of the lungs ceaſes, they no longer receive air, which is neceſſary to their chemical phenomena, the ceſſation of which interrupts the action of the heart.

All phyſiologiſts have admitted that the pulmonary circulation is interrupted in the former of theſe two ways. They have conceived, that where the lung is not diſtended, its veſſels are folded and compreſſed, and therefore tranſmit the blood with difficulty: and by this explanation, derived from hydraulic phenomena, they have accounted for the death which enſues, where expiration is too long continued.

Goodwyn proved that a ſufficient quantity of air remained in the pulmonary veſicles to allow mechanically the paſſage of the blood; and, conſequently, that protracted expiration is not fatal in the way commonly ſuppoſed. (Connection of Life with Reſpiration, &c.) An experiment, which any one may very eaſily perform in his own perſon, will prove that point very eaſily. Let him exſpire as fully as poſſible, and not inſpire again: the pulſe is not changed, and conſequently the circulation through the lungs is not impeded. But the numerous and varied experiments of Bichat place the ſubject beyond all doubt. Exhauſt, ſays he, the lungs of an animal, by means of a ſyringe inſerted in the trachea, and open the carotid artery. Here the circulation ought to be ſuddenly interrupted, according to the common ſuppoſition, ſince the pulmonary veſſels are reduced from their ordinary degree of diſtention to the greateſt poſſible collapſe and folding: yet the blood continues for ſome time to be forcibly thrown out of the opened artery, and muſt conſequently circulate through the lung in this ſtate of extreme collapſe. The ſame circumſtance is obſerved when the lungs collapſe, in conſequence of the thorax being opened on both ſides; even if, in addition to this collapſe, we exhauſt the air more effectually with a ſyringe.

The pulmonary circulation is continued, and even performed with facility, when collections of water, pus, or blood, exiſt in the cheſt, and diminiſh, in a very conſiderable degree, the air-cells of the lungs; and when, conſequently, the angles and folds of the veſſels, if they are found at all, muſt be very conſiderable. We may conclude, then, that the interruption of the mechanical phenomena of reſpiration does not ſtop the heart's action directly; but that it operates indirectly, by cutting off the ſupply of the material, which is neceſſary for the exerciſe of the chemical phenomena.

The death which ſucceeds to protracted inſpiration has been aſcribed to the mechanical diſtention of the pulmonary veſſels by the air, which has been ſuppoſed to impede the circulation through them. But this explanation is as ill-founded as that which we have juſt conſidered. Diſtend the lungs of an animal by injecting a large quantity of air, and confine this by a ſtopcock faſtened in the trachea; then open the carotid artery. The blood continues to flow for ſome time with its natural freedom.

Two opinions have been entertained concerning the manner in which the interruption of the chemical phenomena of the lungs produces a ceſſation of the heart's action. According to Goodwyn, the black blood does not ſtimulate the left ventricle; ſo that, in his manner of viewing aſphyxia, death takes place, becauſe that cavity ſends nothing to the different organs. Its ſource, therefore, is excluſively in the heart. Bichat conceives, that when the chemical phenomena of the lungs are interrupted, there is a general affection of all the organs: that the black blood carries to every part debility and death, ſo that the organs do not ceaſe to act becauſe they receive no blood, but becauſe they receive no red blood. The effects of the contact of black blood on the organs of the body will be illuſtrated preſently; we ſhall conſider here the phenomena of its contact with the parietes of the heart.

Many circumſtances ſhew that the black blood is capable of ſtimulating the left ventricle, ſo as to excite it to contraction. If this were not the caſe, death ſhould commence in aſphyxia with the ceſſation of the heart's action, and the annihilation of the functions of the brain ſhould be ſecondary. But, kill an animal by ſtopping the trachea, by placing it in vacuo, by drowning or immerſion in noxious gaſes, &c. and you will conſtantly obſerve, that the animal life is firſt interrupted, that the ſenſations, motions, and voice are ſuſpended, ſo that the animal is dead externally, while the heart ſtill beats and the pulſe is kept up for ſome time. The different organs, therefore, do not ceaſe to act in aſphyxia, becauſe the heart ſends them no blood, but becauſe it ſends a kind of blood which is not ſuited to them.

Let the trachea of an animal be ſtopped and an artery opened, the blood iſſuing from the latter is at firſt red, then grows gradually darker, and at laſt is black venous blood. Nevertheleſs, it is ſtill expelled for ſome time with conſiderable force. If the lungs be exhauſted by a ſyringe, previous to cloſing the trachea, and an artery then opened, black blood comes from it immediately, without going through the ſhades mentioned before, and a tolerably ſtrong jet is kept up for ſome time. If the black blood did not poſſeſs the power of exciting the left ventricle, its flow ſhould be ſuddenly interrupted in this caſe, where it can undergo no change from the lung, and exiſts in the aorta in the ſame ſtate as in the venæ cavæ.

It is moreover ſtated by Bichat, that he has re-excited the contractions of the left ventricle, after they had ceaſed in various kinds of violent death, by injecting black blood through one of the pulmonary veins. It is obvious too, that when ſuſpended reſpiration is reſtored by inflating the lungs, the left ventricle muſt firſt propel the black blood with which it is loaded, before the red blood can arrive at the lungs. The heart of red blood has, therefore, the power of impelling black blood into all the organs; and in this way we explain the peculiar colour of the different ſurfaces in aſphyxia.

The mere contact of black blood has no more ſenſible action on the internal ſurface of the arteries than on that of the heart. If, when the trachea is cloſed, an artery of the foot be opened, the blood is propelled from it for ſome time with the natural force.

"From theſe conſiderations and experiments we may conclude," ſays Bichat, "that the black blood has the power of exciting the internal ſurface, and determining the action of the heart and arteries; and that if no other cauſe interfered with their functions the circulation might be continued, not, perhaps, with equal force, but at leaſt in a very ſenſible manner. What then are the cauſes which interrupt the circulation in the heart of red blood and in the arteries, when the lung tranſmits to them only black blood? For when the latter has flowed for ſome time, the jet is gradually weakened, and at laſt entirely ceaſes: if the ſtopcock fixed in the trachea be now opened, it is again ſpeedily reſtored. I believe that the black blood acts upon the heart as upon all other parts, as we ſhall ſee that it influences the brain, the voluntary muſcles, the membranes, &c.; that is to ſay, by penetrating its tiſſue, by debilitating each individual fibre. I am well convinced, that if black blood could be circulated in the coronary veſſels, while the red ſhould paſs as uſual through the left auricle and ventricle, the circulation would be interrupted almoſt as quickly as in the preceding caſes." We conclude then, in general terms, and without attempting to determine how this takes place, that the heart's action ceaſes when the chemical phenomena of the lungs are interrupted, becauſe the black blood, which penetrates its muſcular fibres, is not capable of keeping up their action.

In this view of the ſubject, the right ventricle will be as much affected as the left, ſince the black blood is diſtributed equally to the fibres of each. Yet the latter ceaſes to act firſt, and this is ſo conſtantly and well known a fact, that the right ſide of the heart has been called the ultimum moriens. This ariſes, as Haller has already clearly explained, from the circumſtance of the right cavities being longer excited than the left. (See HEART, and CIRCULATION.) It does not prove that the left ventricle dies firſt in aſphyxia. If that were the caſe, the left auricle and ventricle ſhould be diſtended with blood after death, and this diſtention ſhould be propagated from them into the pulmonary veins and right ſide of the heart; that is to ſay, the congeſtion of blood ſhould begin in the reſervoir which firſt ceaſes to act, and it ſhould be propagated from that into the others. The examination of animals, who have periſhed from aſphyxia, ſhews us, on the contrary, that the cavities of red blood and the pulmonary veins contain but a ſmall quantity of black blood in compariſon with that which diſtends thoſe of the oppoſite ſide; that the point at which the blood has ſtopped is principally in the lung, from which we are to trace its ſtagnation in the whole venous ſyſtem; and that the arteries contain as much in proportion as the correſponding ventricle, ſo that death cannot be ſuppoſed to have begun in it rather than in any other part.

Bichat ſtates afterwards, that he cannot entirely reject the notion of the leſs aptitude of the black blood to ſtimulate the left ventricle. When an artery is opened, a ſtopcock being fixed in the trachea and cloſed, the jet of blood is gradually weakened; open the ſtopcock, and the blood becomes again immediately red, and is thrown out more forcibly. This change is too ſudden to admit of our accounting for it by the red blood penetrating the tiſſue of the heart. Yet it may happen from the powerful motions of inſpiration and exſpiration which the animal makes as ſoon as air enters the cheſt. For if an artery be opened, and reſpiration thus hurried, the jet of blood will be manifeſtly increaſed. On the whole, therefore, even if it be allowed that red blood is a more powerful ſtimulus to the heart than black, the exceſs muſt be very trifling.

In connection with this ſubject, we may conſider the explanation of the remarkably diſtended ſtate, in which the pulmonary artery, the right cavities of the heart, and the venous ſyſtem are found in inſtances where death commences in the chemical phenomena of the lungs, compared with the comparatively empty condition of the ſyſtem of red blood. The phenomenon is ſo remarkable as to have attracted the attention of all who have opened the bodies of animals killed by aſphyxia; it has been commonly explained by the folds of the pulmonary veſſels, which we have already conſidered.

The lungs are found in two very different ſtates, according to the manner in which life ends: when death is inſtantaneous, they are not loaded with blood; the auricle and ventricle of black blood, the pulmonary artery, and the general venous ſyſtem, are not remarkably diſtended. On the contrary, when the chemical phenomena of reſpiration are ſlowly deſtroyed, when an animal has been kept as long as poſſible in the diſtreſs and anguiſh which attend interruption of the functions of the lungs, theſe organs are extremely loaded with blood, and diſtended to a volume very far exceeding that which they preſent in the other caſe. In whatever condition the lungs of an animal, which has periſhed by aſphyxia, may be found, whether they be loaded or empty, and conſequently whether death have been brought on ſlowly or ſuddenly, the vaſcular ſyſtem of black blood is always full of this fluid, particularly about the heart; there is conſtantly a great difference in this reſpect between it and the vaſcular ſyſtem of red blood, and conſequently the principal obſtacle to the circulation is in the lung.

Bichat explains this phenomenon from certain conſiderations connected with the blood, the lung, and the heart.

1. The black blood circulating in the arteries is incapable of furniſhing to the organs of ſecretion, exhalation, and nutrition, the various materials neceſſary for the exerciſe of thoſe functions; or if it conveys the materials, it cannot excite the organs. Hence, the venous ſyſtem receives an unuſually large quantity of blood, as all that portion, which is ordinarily removed by the functions juſt mentioned, enters it; and the difficulty of the paſſage through the lungs is proportionally augmented. All obſervers have been ſtruck by the great abundance of blood found in the veſſels in theſe caſes.

2. The lung is no longer excited by red blood: the bronchial veſſels carry black blood to it, and hence its powers are enfeebled, as thoſe of the heart are by the ſame fluid conveyed to it by the coronary arteries Again, the pulmonary capillary ſyſtem contains nothing but black blood. That the tonic powers, by which the circulation is carried on in thoſe veſſels, muſt be much depreſſed from this cauſe, cannot be doubted. Moreover, the habitual excitation of the mucous ſurfaces by the atmoſpheric air is interrupted; and this muſt aſſiſt in lowering the tonic powers.

3. The auricle and ventricle of black blood act more weakly, and are leſs capable of ſurmounting any reſiſtance in the lung in conſequence of their fibres being penetrated by black blood. They can no longer reſiſt the blood brought by the venæ cavæ, and become diſtended by it.

Theſe conſiderations ſeem to account ſatisfactorily for the diſtention of the ſyſtem of black blood in aſphyxia; we have next to explain why the ſyſtem of red blood contains a quantity comparatively ſo ſmall. As the obſtacle exiſts in the lungs, a ſmaller quantity arrives at the left ſide of the heart. The natural ſtrength of the left ventricle and the arteries exceeds that of the right and the veins; conſequently the former can more eaſily overcome the reſiſtance of the capillaries of the body in general, than the latter can that of the pulmonary capillaries. Again, there is only one cauſe of retardation in the general capillary circulation, *viz.* the contact of black blood with the organs; while there is added to this cauſe in the lungs, the abſence of the habitual excitation produced by the atmoſpheric air. Thus, we find in the lungs more reſiſtance to the blood brought by the veins, and leſs force to overcome that reſiſtance; while in the body in general the obſtacles at the junction of the arteries and veins are more feeble, and the force tending to overcome them is greater.

Although the general capillary ſyſtem offers leſs reſiſtance to the arteries, than the pulmonary capillaries do to the veins in aſphyxia, yet there is a manifeſt obſtruction even here; and it gives riſe to two remarkable phenomena. Black blood is collected in the arteries in a much greater quantity than uſual, although in a ſmaller proportion than in the veins; hence injection ſucceeds badly in ſuch ſubjects. The accumulation of black blood in the extremities of the arteries gives a livid colour to all the ſurfaces of the body, and a bloated appearance to the various parts, as the face, tongue, lips, &c. Theſe two phenomena indicate a congeſtion of black blood in the arterial extremities, as the analogous appearances of the lungs denote a difficulty of paſſage through the pulmonary capillaries, where indeed the congeſtion is much more manifeſt, becauſe the ſyſtem is concentrated within a ſmall ſpace, while the other is ſpread over the whole body.

Influence which the Death of the Lung produces on that of the Brain.—The black blood acts upon the brain as it does on the heart; that is, by penetrating its tiſſue, and depriving it of the excitation neceſſary for keeping up its action. What we have ſaid concerning the heart is therefore equally applicable to this ſubject. The experiments of Bichat on this point have been very numerous and diverſified. He firſt transfuſed through a tube the blood of the carotid of one dog into the carotid of another: this does not hurt the animal if a vein be opened to obviate plenitude of the veſſels.

It proves that the contact of extraneous red blood does not injure the cerebral functions. He then opened the jugular vein and carotid artery of a dog, received the blood of the former in a ſyringe heated to the temperature of the body, and injected it into the latter. The animal was almoſt immediately agitated; the reſpiration was hurried, and the diſtreſſing kind of ſuffocation that belongs to aſphyxia was produced. Soon all the ſymptoms of the latter ſtate appeared; the animal life was entirely ſuſpended; the heart ſtill continued to beat, and the circulation went on for half an hour, at the end of which time the organic life alſo was extinct. This experiment was often repeated, and invariably with the ſame reſult: about ſix ounces of black blood were injected. If the point of the ſyringe was inſerted into the vein, ſo as to draw up the blood without any poſſibility of its coming in contact with the air, the reſult was the ſame, except that death came on rather more ſlowly. Various other ſubſtances, ſuch as ink, oil, wine, water coloured blue, urine, bile, mucous fluids, produced the ſame effects. That the fatal effects ariſe in theſe caſes from the action of the black blood, &c. on the brain, and not on the internal ſurface of the arteries, is proved by injecting them into the crural artery; the injection is never mortal, although numbneſs and even paralyſis generally follow. If blood be taken from the carotid artery of an animal who is ſuffering aſphyxia, and injected into that of another, the ſame effects with thoſe already mentioned are produced. Alſo, if the carotids of two dogs are united by a ſilver tube, ſo that the heart of the one ſends its blood to the brain of the other, and a ſtopcock be placed in the trachea of the former, no bad effect is produced, ſo long as that remains open. Cloſe the ſtopcock, and black blood will be ſent inſtead of red. Now, the dog whoſe carotid receives this blood becomes confuſed and agitated, drops his head, and loſes his ſenſes; but theſe phenomena come on more ſlowly than when black blood taken from the venous ſyſtem is injected into the artery. If the transfuſion be ſtopped, the ſymptoms of aſphyxia may go off, and the animal recover; but death invariably follows the injection of black blood with a ſyringe.

In ſumming up his experiments, Bichat concludes, that the nature of the principles contained in the black blood render it either incapable of exciting the action of the brain, or actually injurious to the organ; but he cannot decide whether its influence is exerted negatively or poſitively.

He proceeds to make ſome intereſting obſervations on the nature and treatment of aſphyxia. "We might conclude," ſays he, "from the above-mentioned facts, that the beſt mode of treating thoſe who are ſuffering from aſphyxia, would be to impel into the brain red blood, which is its natural ſtimulus. Two points of time ſhould be diſtinguiſhed in aſphyxia; 1, that in which the central functions alone are ſuſpended; 2, when the circulation as well as the movements of the cheſt have ſtopped; for, in this affection, the animal life is firſt ſuddenly extinguiſhed, and the organic ceaſes after a certain interval. In the firſt of theſe periods, the transfuſion of red blood towards the brain, from the carotid of another animal, gradually re-animates the powers of motion; the cerebral functions are partly reſtored, and the arrival of blood in the brain is often announced by ſudden agitations of the head, eyes, &c.; but this improvement ſoon diſappears, and the animal relapſes if the cauſe continues, as for example, if the ſtopcock in the trachea remains ſhut. On the other hand, if the ſtopcock be opened in this firſt period, the arrival of freſh air in the lungs almoſt always gradually re-animates theſe organs. The blood aſſumes the red colour, and is ſent in that ſtate to the brain, and life is reſtored without transfuſion, which is completely ineffectual in the ſecond period of aſphyxia, that is, when the organic movements, particularly thoſe of the heart, are ſuſpended. The transfuſion of red blood towards the brain does not, therefore, afford us any remedy in the caſe of aſphyxia. Neither does it ſucceed after the injection of venous blood into the brain by means of a ſyringe, which is invariably fatal. Aſphyxia produced by injecting blood taken from the vein into the brain is more prompt and certain, than that occaſioned by the gradual change of the red into black blood, conſequent on interrupted reſpiration; and the nature of the two caſes is manifeſtly different."

The phenomena of aſphyxia, as obſerved in the human ſubject, coincide very well with what is obſerved in experiments on animals. In all caſes the brain is firſt affected, its functions are annihilated, and the animal life, particularly ſo far as regards the ſenſes, ceaſes; the internal functions are ſubſequently arreſted. When aſphyxia is produced in an animal with an artery open, it is curious to obſerve how the affection of the brain coincides with the change of colour in the blood, while the energy of the heart is unabated. Moſt of thoſe who have been expoſed to aſphyxia, and have eſcaped ſuffocation, have experienced only a general kind of benumbing or paralyſis, the ſeat of which is manifeſtly in the brain; while all in whom the pulſe and heart have ceaſed to beat, certainly die. Almoſt all who have recovered ſay, that they felt firſt more or leſs violent pain in the head, produced probably by the firſt contact of black blood with the brain. Bichat conſiders the common notions of the effects of charcoal vapours on the head, and the expreſſions concerning the heavineſs, giddineſs, &c. produced by them, as ſtrong proof that the firſt influence is in fact exerted on the brain. He obſerves further, that many individuals who have recovered from aſphyxia produced by this cauſe, exhibit, for a longer or ſhorter period, various affections of the intellectual functions and voluntary motions, as for inſtance confuſion of ideas, and unſteady motions of the lower limbs; the ſame effects, in a ſmaller degree, which apoplexy produces more ſenſibly. Convulſive motions have ſometimes taken place almoſt immediately after expoſure to mephitic vapours; and a pain in the head has often laſted many days after the diſappearance of the other ſymptoms.

From the foregoing conſiderations, Bichat deduces the following concluſions; 1ſt, that when the chemical phenomena of the lungs are interrupted, the black blood acts upon the brain as upon the heart, that is, by penetrating its tiſſue, and thereby depriving it of the excitation neceſſary to its action; 2dly, that its influence is much more promptly exerted on the former than on the latter of theſe two organs; 3dly, that the inequality of their influence determines the difference obſerved in the ceſſation of the two lives in aſphyxia, where the animal always ceaſes before the organic. Hence we may infer, how unfounded the opinion is, that in thoſe who are executed by the guillotine, the brain ſtill continues to live ſome time, and that ſenſations of pleaſure and pain may ſtill be referred to it. The action of this organ is intimately connected to its double excitation; 1ſt, by the motion, and 2dly, by the nature of the blood which it receives. As this excitation is ſuddenly interrupted in that mode of death, all feeling is as ſuddenly ſuſpended.

Influence of the Death of the Lung on that of the Organs of the Body in general.—Bichat commences his view of this ſubject by examining the changes of colour which the blood undergoes when the chemical phenomena of the lungs are interrupted. He found the beſt method of obſerving theſe changes to be by fixing a ſtopcock in the trachea of an animal, by which the quantity and kind of air introduced into the lungs can be regulated, and placing a ſmall tube with a ſtopcock in an artery, as the carotid or crural, which enabled him to aſcertain how the blood was altered.

1. When the ſtopcock is cloſed immediately after an inſpiration, the blood grows darker in thirty ſeconds; it has acquired a deep tint in a minute, and it poſſeſſes entirely the appearance of venous blood in a minute and a half, or two minutes.

2. The production of the black colour takes place more quickly by ſeveral ſeconds, if the ſtopcock be ſhut after exſpiration, particularly if it has been a complete one.

3. If the air be drawn out of the lungs by a ſyringe, the blood becomes immediately black: twenty or thirty ſeconds are ſufficient for the change. No ſucceſſive gradations of colour are obſerved.

4. If the lungs be extended by injecting air into them, and cloſing the ſtopcock, a longer time is neceſſary for changing the blood into the black ſtate: three minutes will then be required.

Theſe phenomena are obſerved in the paſſage of the animal from a ſtate of aſphyxia to death: a ſeries of an oppoſite nature is ſeen when it is reſtored from aſphyxia to life.

1. When the ſtopcock, after being cloſed for ſome minutes, is opened, the animal immediately performs ſix or ſeven great inſpirations and exſpirations. A jet of red blood ſucceeds the black, which was flowing before; and the interval between the two is at moſt thirty ſeconds. There is no ſucceſſive change of tints, but a certain and decided alteration.

2. If a ſmall quantity only of air be admitted, the change of colour is leſs conſiderable.

3. If freſh air be injected, and the ſtopcock then cloſed, the blood becomes red, but leſs manifeſtly than when the air is admitted by voluntary reſpiration: in the latter caſe the animal firſt expels the air that had become ſpoiled.

4. If the air incloſed in the lung be drawn out by a ſyringe, and freſh air injected, the change of colour is effected more rapidly than in the preceding caſe.

5. When the lung is expoſed by cutting through the ribs, the circulation is continued for a certain time. If it be alternately diſtended and emptied by means of a ſyringe, the red and black colours are ſtill produced ſo long as the circulation is kept up.

From the rapidity with which the blood, in theſe experiments, is changed from black to red on opening the ſtopcock, we cannot help concluding that the principle which cauſes this alteration paſſes directly from the lung into the blood, through the membranous lining of the air-cells. The acceleration of the motions of the heart in animals undergoing aſphyxia, as in the famous experiment of Hook, by injecting air into the trachea, muſt be referred to the red blood penetrating the fibres of the heart, and putting an end to the debility which the contact of black blood was producing. Yet this method will never re-produce the motions of the heart when they have been once annihilated by the contact of black blood. Bichat has often tried this without ſucceſs. The heart, ſays he, cannot be re-animated by the action of the air, unleſs the blood, coloured by that fluid, could penetrate the organ. When the circulation is ſtopped, how can this take place?

Hydrogen and carbonic acid gaſes were employed in reſpiration by filling bladders with them, and fixing them to the tube in the trachea. The bladder is alternately diſtended and emptied as the animal exſpires and inſpires. He is at firſt tolerably quiet, but in about three minutes begins to be agitated; reſpiration becomes hurried and troubled, the blood flowing from an artery grows darker, and is black at the end of four or five minutes. There was very little difference in the time required for the change, or intenſity of the colour, whichever of the two gaſes was employed.

The reaſon why the change of colour takes place more ſlowly when theſe bladders are adapted to the ſtopcock, than when the latter is cloſed, ſeems to be, that the air contained in the trachea and its branches is repeatedly thrown from the lung into the bladder, and *vice verſâ;* ſo that its whole reſpirable proportion is ſucceſſively preſented to the blood. This motion cannot take place in the latter caſe; ſo that as ſoon as the pure part of the air contained in the bronchial cells is exhauſted, the blood is no longer converted into the red ſtate, although the trachea and its large diviſions ſtill contain a conſiderable quantity of air capable of ſerving the purpoſes of reſpiration. It appears that the converſion of the blood goes on only at the extremities of the bronchial ramifications, and that the internal ſurface of the large air-veſſels has no connection with this phenomenon.

We have already ſeen that the action of the heart continues for ſome time after the chemical phenomena of the lungs have been interrupted; the arterial circulation is therefore ſtill maintained, although the arteries contain a different fluid from that which is natural to them; and the organs of the body, accuſtomed only to the red blood, become penetrated, in conſequence of this circulation, by black blood. Bichat has proved this by expoſing various parts in an animal, while the ſtopcock in its trachea was cloſed, and the animal was conſequently undergoing aſphyxia. He has examined in this way the muſcles, the nerves, the ſkin, mucous and ſerous membranes, and the granulations of wounds, and found that the black blood penetrated them all, and produced more or leſs conſpicuous alterations in their colour, which was rendered either brown or livid. The phenomenon is very obvious in the ſkin, which always preſents more or leſs extenſive livid ſpots in aſphyxia. Theſe can only be explained by the exiſtence of an obſtacle to the tranſmiſſion of the blood in the general capillary ſyſtem: in the ſame way we account for the ſwelling of various parts, as the cheeks, lips, and head in general.

The black blood does not penetrate at all into ſome parts of the general capillary ſyſtem, and the natural colour is conſequently preſerved: in others it manifeſtly enters and is obſtructed, producing a dark colour at the part, and moreover a tumefaction, if it enters in large quantity: or, laſtly, it may paſs this ſyſtem and enter the veins. In the two former caſes the general circulation is arreſted in the capillary ſyſtem; in the latter, which is the more general, the courſe of the blood is ſuſpended in the capillaries of the lungs.

The fact that the black blood continues to be circulated for ſome time after the chemical phenomena of the lungs have been interrupted, explains a phenomenon, which muſt have been obſerved by all who are much employed in diſſections; *viz.* that in the dead body we meet with black blood only, even in the veſſels which naturally carry red blood. However death may be produced, the functions of the lungs are troubled in the laſt moments of exiſtence, and end before thoſe of the heart. The blood ſtill moves, although it no longer receives the influence of the air: it is therefore circulated black for a certain length of time, and remains in that ſtate in the organs, although the circulation is much leſs evident than in aſphyxia.

After having ſhewn that the interruption of the chemical phenomena of reſpiration prevents the black blood from being converted into the red ſtate, and that this black blood is circulated through the body by the ſtill ſurviving action of the heart, Bichat proceeds to ſhew that the black blood is not capable of maintaining the vital powers and activity of the organs, which are therefore killed by its contact. The red blood, he ſays, gives to the organs their natural and healthy excitation, by which their vital powers are ſupported. Poſſibly this effect may be produced by the combination of the different principles that colour it, with the various organs in which it is contained.

The organs of the animal and of the organic life have their actions terminated in different ways. The former, being entirely dependent on the brain, have their functions ſuſpended as ſoon as thoſe of the brain ceaſe. We have already ſhewn that the contact of black blood produces the latter effect almoſt inſtantly; conſequently the organs of ſenſation, locomotion, and the voice, muſt be ſuddenly paralyſed in aſphyxia. But the circulation of the black blood produces ſtill further effects: when it penetrates the nerves, it renders them incapable of keeping up the communication between the brain and the ſenſes on one ſide, and the locomotive and vocal organs on the other. The contact of the black blood with the organs themſelves alſo annihilates their action. Inject into the crural artery of an animal blood drawn from one of its veins; the motions are ſoon weakened very perceptibly, and ſometimes a momentary paralyſis is produced. The effect cannot be aſcribed to tying the artery, for that alone is often attended with no ſuch conſequence, whereas the reſult of injecting black blood is always the ſame, except indeed that it varies in duration and intenſity. Senſation is alſo manifeſtly ſuſpended in this experiment, but later than the power of motion. The effect is always produced, particularly if the injection of black blood be repeated three or four times at ſmall intervals.

The organs of the internal life being independent of the cerebral action, have not their functions arreſted, like thoſe of the external life, by the ſuſpenſion of that action. It is the contact of the black blood only that acts in this caſe, and conſequently the death of theſe organs has one cauſe leſs than that of the locomotive and vocal parts, &c. We have already explained the influence of the black blood on the organs of circulation, and have ſhewn how the heart ceaſes to act as ſoon as it is thoroughly penetrated by that fluid. Its circulation in the veſſels of the coats of the arteries and veins weakens thoſe tubes, and ſuſpends their action. It muſt be exceedingly difficult, if not impoſſible, to bring forward any ſtrict proof that the ſecretions, exhalation, and nutrition cannot derive from the black blood materials ſuited to their offices; for that blood does not circulate in the arteries long enough to admit of our making experiments on thoſe functions. We muſt rely, therefore, chiefly on the analogy of what happens in other parts, to prove that the organs of ſecretion, exhalation, and nutrition have their functions interrupted when black blood is ſent to them. This ſtatement is very much corroborated by the quantity of blood found in the veſſels of thoſe who have periſhed by aſphyxia; it is ſo large as to be very troubleſome in diſſecting ſuch bodies, which might naturally be expected when the uſual outlets of the ſecretions, &c. are ſtopped.

From the preceding conſiderations Bichat concludes, that when the chemical functions of the lungs are interrupted, all the organs of the body ceaſe to act ſimultaneouſly, in conſequence of the contact of black blood; that their death coincides with that of the heart and brain, although it is not derived immediately from that cauſe; that, if it were poſſible for theſe two organs to receive red blood, while black was ſent to the others, the functions of the latter would ceaſe, while thoſe of the former would be continued: in a word, that aſphyxia is a general phenomenon, taking place at the ſame time in all the organs, and not more decidedly marked in any particular one.

By reſuming and comparing what has been ſaid concerning the influence of the lungs on the heart, the brain, and the organs in general, we ſhall eaſily form an idea how all the functions ſucceſſively terminate, when the reſpiratory phenomena are interrupted. When the mechanical phenomena are ſuſpended; 1, there are no more chemical phenomena, for want of air to ſupport them; 2, no more action of the brain, for want of red blood to excite it; 3, ceſſation of the animal life, that is, of the ſenſations, locomotion, and the voice, becauſe the organs are no longer excited by the brain, nor by red blood; 4, ceſſation of the general circulation; 5, ceſſation of the capillary circulation, of ſecretion, abſorption, and exhalation, in conſequence of the organs of thoſe functions being no longer excited by red blood; 6, no more digeſtion, for want of ſecretion and excitation of the digeſtive organs, &c.

When the chemical functions of the lungs are interrupted, the phenomena of death ſucceed in a different order: 1, interruption of the chemical phenomena; 2, ſuſpenſion of the action of the brain; 3, ceſſation of the ſenſations, and of voluntary motions, conſequently of the voice, and the mechanical phenomena of reſpiration; 4, ſtoppage of the heart's action, and of the general circulation; 5, termination of the capillary circulation, of the ſecretions, exhalation, abſorption, and conſequently of digeſtion; 6, annihilation of animal heat, which is the reſult of all the functions, and which does not leave the body until every kind of vital proceſs is extinguiſhed. In whatever function death may begin, it always ends in this.

There is a very intimate connection between the brain and the lungs: as ſoon as the former ceaſes to act, the functions of the latter are interrupted. This phenomenon, which is conſtantly obſerved in warm-blooded animals, can happen only in two ways: 1, becauſe the action of the brain is directly neceſſary to that of the lung; or 2, becauſe the latter receives from the former an indirect influence through the intercoſtal muſcles and diaphragm, an influence which ceaſes as ſoon as the brain becomes inactive.

The lung can influence the brain directly only through the par vagum and the great ſympathetic nerve. Irritation of the former renders reſpiration hurried, but this is an effect produced by any conſiderable pain. Diviſion of one nerve of the eighth pair affects the breathing for a time: but this goes off, and the reſpiratory functions are then carried on with their accuſtomed regularity. If both nerves are cut, reſpiration is ſtill more hurried: it does not return to its ordinary rate, as in the preceding experiment, but continues laborious for four or five days, when the animal periſhes. Hence we ſee that the eighth pair is neceſſary to the pulmonary functions, and conſequently that the brain has ſome influence on theſe functions: but the agency is not a very active or important one, ſince the functions of the lung are continued for a long time without it, and conſequently reſpiration is not ſuddenly ſtopped, through its interruption in injuries of the brain. Experiments ſhew that the interception of the influence derived from the great ſympathetic is equally inadequate to interrupt the functions of the lungs.

Since the lung is not affected immediately from the interruption of the action of the brain, there muſt be ſome intermediate organs, through which the former is acted on by the latter. Theſe are the muſcles of reſpiration. Subject, by the nerves which they receive, to the immediate influence of the brain, they become paralytic as ſoon as the action of the latter has ceaſed. If the ſpinal marrow be divided between the laſt cervical and firſt dorſal vertebra, the intercoſtal muſcles are paralyſed, and reſpiration is carried on by the diaphragm only. If the phrenic nerves be cut, the diaphragm is rendered motionleſs, and the intercoſtals alone perform breathing. In either of theſe caſes life may be continued for ſome time. But if the phrenic nerves and the ſpinal marrow about the bottom of the neck be both divided; or, which comes to the ſame thing, if the ſpinal marrow be cut through above the origin of the phrenic nerves, all communication between the brain and the agents of reſpiration is ſuſpended, and death immediately follows. The difference of half an inch in the height at which the ſection is made is ſo important, that, if it be done at one point, the animal ſhall live fifteen or twenty hours, if half an inch nearer to the brain, he will die immediately. In the former caſe it is below, in the latter above the origin of the phrenic nerve: in the one inſtance reſpiration and conſequently life ceaſes, becauſe the diaphragm and intercoſtal muſcles can act no longer; in the other the diaphragm carries on the reſpiratory functions, and conſequently ſupports life for ſome time.

The facts juſt detailed ſhew, that when the nervous ſyſtem is injured above the origin of the phrenic nerves, the phenomena of death ſucceed in the following order: 1, ſuſpenſion of the action of the voluntary nerves below the injury, and conſequently of the intercoſtal and phrenic; 2, paralyſis of all the muſcles of the animal life ſupplied by thoſe nerves, particularly of the diaphragm and intercoſtal muſcles; 3, ceſſation of the mechanical phenomena of reſpiration, for want of the agents neceſſary to thoſe phenomena; 4, annihilation of the chemical phenomena. The interruption of all theſe motions is as rapid as their ſucceſſion is quick in the natural order. Death comes on in this way from a diviſion or compreſſion of the medulla ſpinalis near the brain, from a luxation of the ſecond vertebra, from concuſſion or compreſſion of the brain, &c.

Thus we ſee that reſpiration is a function of a mixed kind, placed in a manner between the two lives, and ſerving as their point of contact, belonging to the animal life by its mechanical, and to the organic by its chemical phenomena. Hence the activity of the lung depends as much on that of the brain, which is the centre of the former, as on that of the heart, which is the central organ of the latter.

LUNGS, *Conſumption of.* See CONSUMPTION.

LUNGS, *Dropſy of.* See DROPSY.

LUNGS, *Inflammation of.* See PERIPNEUMONY.

LUNGS, *Polypus of the.* See POLYPUS.

LUNGS, *Wounds of the.* See WOUNDS.

LUNGS *of Inſects.* See ENTOMOLOGY and INSECTS.

LUNGS, *Sea,* in *Zoology.* See MEDUSA.

LUNGS, *Ship's.* See VENTILATOR.

LUNGSARP, in *Geography,* a town of Sweden, in Weſt Gothland; 57 miles from Gotheborg.

LUNGSUND, a town of Sweden, in Warmeland; 25 miles N.E. of Carlſtadt. N. lat. 58° 48'. E. long. 13° 54'.

LUNGU, a ſmall iſland in the Eaſt Indian ſea, near the coaſt of Queda. N. lat. 6° 39'. E. long. 99° 42'.

LUNG-WORT, in *Botany, &c.* See PULMONARIA.

LUNG-WORT, *Cow's* or *Bullock's.* See VERBASCUM.

LUNISOLAR, in *Aſtronomy* and *Chronology,* denotes ſomething compoſed of the revolution of the ſun, and of that of the moon.

LUNISOLAR *Year,* is a period of years made by multiplying the cycle of the moon, which is nineteen, by that of the ſun, which is twenty-eight; the product of which is five hundred and thirty-two; in which ſpace of time thoſe two luminaries return to the ſame points.

LUNKA, in *Geography,* a town of Samogitia; 40 miles N.E. of Miedniki.

LUNTENBURG, or BRZEDSLAW, a town of Moravia, in the circle of Brunn; 36 miles S.E. of Brunn.

LUNTZ, a town of Auſtria; 15 miles S.E. of Bavarian Waidhofen.

LUNULA, in *Geometry.* See LUNE.

LUNULA, the *Half-moon,* among the Romans, an ornament the patricians wore on their ſhoes.

LUNULA was alſo an ornament in form of a moon, worn by the ladies.

LUNULAR ANGLES. See ANGLE.

LUNULARIA, in *Botany,* ſo called from the creſcent-ſhaped calyx, as it is now thought to be, of the male flowers. Mich. Gen. 4. t. 4. See *Marchantia cruciata* of Linnæus, who by miſtake cites it by the name of *Lunaria.*

LUNULATUM FOLIUM. See LEAF.

LUOPIOIS, in *Geography,* a town of Sweden, in the province of Tavaſtland; 23 miles N. of Tavaſthus.

LUPANNA, an iſland in the Adriatic, near the republic of Raguſa, which has a good and ſafe harbour. The ſoil, though ſtony, is by the induſtry of the inhabitants rendered fertile. The coaſts abound with fiſh.

LUPARA, a town of Naples, in the Moliſe; 17 miles N.E. of Moliſe.

LUPATA, a chain of African mountains in Mocaranga. S. lat. 13° to 17°.

LUPERCALIA, feaſts celebrated in Greece, and at Rome, in honour of the god Pan.

The word comes from *Lupercal,* the name of a place under the Palatine mountain, where the ſacrifices were performed.

The Lupercalia were celebrated on the fifteenth of the calends of March, that is, on the fifteenth of February; or, as Ovid obſerves, on the third day after the ides. They are ſuppoſed to have been eſtabliſhed by Evander, or brought by him from Arcadia into Italy. The Arundel Marbles aſcribe the inſtitution of theſe feaſts to Lycaon, king of Arcadia, who afterwards polluted them by ſacrificing human victims. This feaſt, after having been interrupted for ſome ages, was re-eſtabliſhed in Athens, in the time of Pandira, as we learn from the 10th era of the ſame marbles. Lycurgus aboliſhed at Lacedæmonia the barbarous cuſtom of offering human victims. Valerius Maximus is of opinion, that this feſtival was only introduced in the time of Romulus, at the perſuaſion of the ſhepherd Fauſtulus.

On the morning of the feaſt, the Luperci, or prieſts of Pan, ran naked through the ſtreets of Rome, ſtriking the married women they met on the hands and belly with a thong, or ſtrap, of goat's leather; which was held an omen promiſing them fecundity and happy deliveries.

The reaſon of this indecent cuſtom, in celebrating the Lupercalia, took its riſe, as it has been ſaid, from Romulus and Remus: for while they were aſſiſting at this feaſt, a body of robbers, taking hold of the occaſion, plundered them of their flocks. Upon this the two brothers, and all the youth that were with them, throwing off their clothes, to be the more expedite, purſued the thieves and recovered their prey. This ſucceeded ſo well, that henceforward this ceremony became a part of the Lupercalia.

This feaſt was aboliſhed in the time of Auguſtus; but it was afterwards reſtored, and continued to the time of the emperor Anaſtaſius. Baronius ſays it was aboliſhed by pope Gelaſius, in 469.

LUPERCI, a name given to the prieſts of the god Pan.

The Luperci were the moſt ancient order of prieſts in Rome; they were divided into two colleges, or companies; the one called *Fabii*, and the other *Quintilii:* to theſe Cæſar added a third, which he called *Julii*.

Suetonius mentions the inſtitution of this new college of Luperci as a thing that rendered Cæſar more odious than he was: however, it appears from the ſame paſſage of Suetonius, that this new company was not inſtituted by Cæſar, nor in honour of Pan, but by ſome friends of Cæſar, and in honour of himſelf.

LUPI Crepitus. See Crepitus.

Lupi, Didier, in *Biography*, a good harmoniſt. In the ſixteenth century he ſet to muſic the ſpiritual ſongs of Guillaume Guerret, publiſhed in 1548. He is mentioned by Rabelais in the prologue of his fourth book.

LUPIA (from λυπεω, *to moleſt*,) denotes, in *Surgery*, a tumour of the ganglion kind, or, according to Cullen, a wen.

LUPIÆ, in *Ancient Geography*, a town and colony of Italy, in Meſſapia, ſuppoſed to have been near the ſcite of the modern Leece; 24 miles S.E. of Brunduſium; but in that vicinity no veſtige of antiquity remains.

LUPINASTER, in *Botany*, Baſtard Lupine; a name given by Buxbaum and Ammann to a Siberian ſpecies of Trefoil, *Trifolium Lupinaſter* of Linnæus.

LUPINE, the common name of a ſpecies of wild pea, cultivated principally for being turned in as a manure.

This plant requires but little trouble or labour in its cultivation, as it will thrive in any ſoil, except the bad chalky, and ſuch as are very wet. It will even grow well upon poor, hungry, worn-out land, eſpecially if it be dry and ſandy. When ſown in February or March, after a ſingle very ſhallow ploughing, and ſlightly harrowed in, it will bloſſom two or three times between May and Auguſt, and prove an excellent enricher of the ground when ploughed in, juſt after its ſecond blooming. The beſt time for mowing this ſort of crop, is after a ſhower of rain, as the ſeeds drop eaſily out of the pods when they are gathered too dry. They muſt, however, be laid up very dry, or worms ſoon breed in them. They are inferior to many other plants for the above uſe.

LUPINUS, in *Botany*, ſo called by Pliny and other ancient writers. Profeſſor Martyn ſays that the word owes its origin to *lupus*, a wolf, becauſe plants of this genus ravage the ground, by over-running it, after the manner of that animal. *Lupinus* is alſo ſaid to be derived from λυπη, *grief*, whence Virgil's epithet, *triſtes lupini*, from the fanciful idea of its acrid juices when taſted producing a ſorrowful appearance in the countenance. Both theſe ideas are avowedly taken from Voſſius.—Lupine.—Linn. Gen. 371. Schreb. 492. Willd. Sp. Pl. v. 3. 1022. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 28. Loureir. Cochinch. 429. Tournef. t. 213. Juſſ. 354. Lamarck Dict. v. 3. 620. Illuſtr. t. 616. Gærtn. t. 150.—Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, cloven. *Cor.* papilionaceous: ſtandard heart-ſhaped, roundiſh, emarginate, its ſides reflexed, compreſſed; wings nearly ovate, almoſt the length of the ſtandard, not affixed to the keel, joined together in the lower part; keel cloven at the baſe, falcate in the upper part, pointed, undivided, of the ſame length but narrower than the wings. *Stam.* Filaments ten, all united, ſomewhat aſcending, diſtinct above; anthers ten, five of them roundiſh, and as many oblong. *Piſt.* Germen ſuperior, awl-ſhaped, compreſſed, villoſe; ſtyle awl-ſhaped, aſcending; ſtigma terminal, obtuſe. *Peric.* Legume large, oblong, leathery, compreſſed, acuminated, of one cell. *Seeds* numerous, roundiſh, compreſſed.

Eſſ. Ch. Calyx two-lipped. Five of the anthers round, five oblong. Legume leathery, toruloſe, compreſſed.

Obſ. The calyx is ſubject to variations in different plants of this genus. Linnæus was acquainted with only ſeven ſpecies of Lupine, at leaſt he has only deſcribed that number. Lamarck has ſeventeen in his dictionary; and Willdenow gives nineteen, which he arranges in three ſections. *Sect.* 1. Herbaceous, with digitate or fingered leaves. *Sect.* 2. Shrubby, with ſimilar leaves. *Sect.* 3. Herbaceous, with ſimple leaves.

Of the firſt ſection are

L. *albus*. White Lupine. Linn. Sp. Pl. 1015. (Lupini; Matth. in Dioſc. v. 1. 392. L. ſativus; Ger. em. 1217.)—Flowers alternate. Calyx without appendages; its upper lip emarginate, the lower undivided. A native of the Levant, cultivated in various parts of Italy and the ſouth of Europe for food. The ſeeds are boiled, and afterwards ſteeped in water to extract their bitterneſs. It is common with the Romans to carry them in their pockets, eating them as they walk along in the ſtreets. The flowers appear in July, the ſeeds in autumn.—*Stem* about two feet high, branched towards the top. *Leaves* fingered, compoſed of ſeven or eight narrow, oblong leaflets, hairy, of a darkiſh grey colour, covered with a ſilvery down. *Flowers* terminal, in looſe ſpikes, white and ſeſſile. *Legumes* ſtraight, hairy, about three inches long, containing five or ſix *ſeeds*, which are roundiſh, flatted, extremely ſmooth and even, perfectly white, and unſpotted.

L. *luteus*. Yellow Lupine. Linn. Sp. Pl. 1015. Curt. Mag. t. 140.—Flowers in whorls. Calyx with appendages; its upper lip cloven, the lower three-toothed.—A native of Sicily. It flowers in July and Auguſt.—*Stem* a foot high, branching. *Leaves* fringed, compoſed of ſeven, eight, or nine hairy leaflets. *Flowers* yellow, fragrant, in whorled ſpikes. *Legumes* ovate, flattiſh, hairy. *Seeds* ovate, a little compreſſed, yellowiſh-white, variegated with dark ſpots.—This is very commonly cultivated in flower-gardens, and ſhould be ſown in the ſpring with other annuals.

The ſecond ſection conſiſts of ſeven ſpecies, all natives of the Brazils or of Peru, and deſcribed originally by Lamarck only, from whom Willdenow has adopted them.

The third ſection compriſes two fine ſpecies, *villoſus* and *integrifolius*, of which we are not acquainted with any figure; the former is a native of Carolina, the latter of the Cape.—Loureiro deſcribes two others of this ſection, *L. cochinchinenſis* and *africanus*, but from the latter having its leaves ternate, like thoſe of *L. trifoliatus*, Cavan. Ic. v. 8. t. 59, we are inclined to think it ſhould be referred to ſome other genus.

Lupinus, in *Gardening*, contains plants of the hardy, herbaceous, annual, and perennial flowery kinds; of which the ſorts moſtly cultivated are, the white lupine (L. albus); the ſmall blue lupine (L. varius); the narrow-leaved blue lupine (L. anguſtifolius); the great blue lupine (L. hirſutus); the yellow lupine (L. luteus); and the perennial lupine (L. perennis).

In the fourth ſort there is a variety which has fleſh-coloured flowers, and which is uſually denominated the *roſe* lupine.

Method of Culture.—Theſe well-known flowering plants may be readily raiſed by ſowing the ſeeds in patches in the borders, with other annuals in the ſpring, where they are to remain;

remain ; thinning them afterwards where they are too cloſe, and keeping them clean from weeds. In order to have a ſucceſſion of flowers, the ſeed ſhould be ſown at different times, as in April, May, and June. The ſeed of thoſe only which are firſt ſown, however, ripens well. And in order to have good ſeed of the fourth kind, ſome ſeeds ſhould be ſown in a ſunny border under a wall, or in pots placed under frames, the plants in the latter caſe being turned out and planted with balls of earth about them in the ſpring. The laſt ſort ſhould be ſown at different times.

Theſe are all uſeful plants for producing variety in the borders, clumps, and other parts of pleaſure grounds and gardens.

LUPO, in *Geography*, a town of Hinder Pomerania, on a river of the ſame name ; 15 miles E. of Stolpe.

LUPOGLAVO, a town of Iſtria ; 22 miles S.E. of Trieſte.

LUPPURG, a town of Bavaria, in the principality of Neuburg ; 16 miles N.W. of Ratiſbon.

LUPULUS, in *Botany*, the diminutive of *lupus*, a wolf, a name applied by the older botaniſts to the Hop, (ſee HUMULUS,) becauſe, as the wolf preys upon other animals, ſo this plant, by immoderately impoveriſhing the ſoil in which it grows, ſtarves its vegetable neighbours. Such at leaſt is the explanation of Ambroſinus.

LUPUS, WOLF, in *Aſtronomy*, a ſouthern conſtellation joined to the Centaur, whoſe ſtars in Ptolemy's Catalogue are nineteen ; in the Britannic Catalogue, with Sharp's Appendix, twenty-four. See CENTAUR, and CONSTELLATION.

LUPUS SERVATUS, in *Biography*, a French abbot, celebrated for his learning, eloquence, and piety, deſcended from a conſiderable family in the dioceſe of Sens, was born about the commencement of the ninth century. He had from early youth a decided turn for theological purſuits, and in 828 he went to the abbey Fulda in Germany, where he ſtudied the ſcriptures under the celebrated Rabanus, who, at his requeſt, compoſed his "Commentaries upon the Epiſtles of St. Paul." He obtained conſiderable church preferment by the patronage of Lewis le Debonnaire, and Charles the Bald ; and by the latter he was ſent ambaſſador to pope Leo IV., and he was appointed, in conjunction with the celebrated Prudentius, to reform all the monaſteries in France. The time of his death is unknown, but it is aſcertained that he was living in 861. He was a conſiderable theological writer : and he publiſhed accounts of the lives of St. Wigbert, and of St. Maximin. A collection has been made of 130 of his "Letters" upon different ſubjects relating to difficulties in grammar, civil and eccleſiaſtical affairs, points of doctrine, diſcipline, and good morals, which are written with elegance, and throw much light on the hiſtory of the period in which he lived. Moreri.

LUPUS, CHRISTIAN, a learned Flemiſh monk of the order of St. Auguſtine, was born at Ypres in 1612, and embraced a religious life at the early age of fifteen. He completed his maturer ſtudies at Cologne, and was afterwards ſent to Louvain to teach philoſophy ; in which he acquired ſuch celebrity, as to ſecure the particular eſteem of the learned Fabio Chigi, then the papal nuncio in Germany, afterwards known as pope Alexander VII. In 1655, Lupus was one of the deputies ſent to Rome by the univerſity of Louvain, to negociate ſome matters of importance with the papal court, which he executed to the ſatisfaction of his employers. On his return he was appointed profeſſor of divinity at Louvain, the duties of which he performed with great ſucceſs. After this he filled the principal poſts belonging to his order in that province. Pope Clement IX. would willingly have made him a biſhop ; and from Innocent XI. and the grand duke of Tuſcany, he received repeated marks of eſteem ; the latter was deſirous of ſettling upon him a conſiderable penſion, that he might attach him to his court. He died in 1681, at the age of ſeventy. He left behind him many valuable works, of which the chief are "Commentaries on the Hiſtory and on the Canons of Councils, both general and particular," in five volumes 4to. ; "A Collection of Letters and Monuments, relating to the Councils of Epheſus and Chalcedon ;" "A Collection of the Letters of St. Thomas of Canterbury, with a Life prefixed ;" "A Commentary on the Reſcriptions of Tertullian." Moreri.

LUPUS, in *Ornithology*, a name given by ſome authors to the *monedula*, or jackdaw, from his voracious appetite and habit of ſtealing. See CORVUS *Monedula*.

LUPUS, in *Surgery*, the diſeaſe frequently called *noli me tangere*.

LUPUS, in *Zoology*, a ſpecies of *Canis*. See WOLF.

LUPUS *Aureus*, the *gold-coloured wolf*, the name by which Latin authors call the creature known in Engliſh by the name of the *jackal*. See AUREUS.

LUPUS *Cervarius*, a name by which many authors have called the *lynx*, from its feeding on deer. See FELIS *Lynx*.

LUPUS *Marinus*, a name given by Jonſton, Bellonius, and Geſner, to the *Canis hyæna*. See HYÆNA.

LUPUS *Marinus*, the *Sea-wolf*, the *Anarhicas lupus* of Linnæus, in *Ichthyology*, a fierce and voracious ſea-fiſh, confined to the northern ſeas of our globe. It is found in thoſe of Greenland, Iceland, and Norway, on the coaſts of Scotland and of Yorkſhire, and in that part of the German ocean which waſhes the ſhores of Holland. Its head is larger in proportion to its ſize than that of the ſhark, and rounder, a little flatted on the top ; the noſe blunt ; the noſtrils very ſmall ; the eyes ſmall, and placed near the end of the noſe ; the body is long, and a little compreſſed ſideways ; the back, ſides, and fins, are all of a livid lead colour ; the two firſt marked downwards with irregular, obſcure, duſky lines, which in different fiſh have different appearances. The young are of a greeniſh caſt ; the belly is white ; the ſkin is ſmooth and ſoft, but his teeth ſo remarkably hard and ſtrong, that if he bites againſt an anchor of a ſhip, or other iron ſubſtance, he makes a loud noiſe, and leaves his marks in the iron ; the fore-teeth are ſtrong, conical, diverging a little from each other, ſtand far out of the jaws, and are commonly ſix above and ſix below, though ſometimes there are only five in each jaw ; theſe are ſupported withinſide by a row of leſſer teeth, which make the number in the upper jaw ſeventeen or eighteen, and in the lower eleven or twelve. The ſides of the lower jaw are convex inwards, and the grinding teeth of this jaw are higher on the outer than the inner edges, and join to the canine teeth, but in the upper are ſeparated from them ; in the centre are two rows of flat ſtrong teeth, fixed on an oblong baſis upon the bones of the palate and noſe ; theſe and the other grinding teeth are often found foſſil, and called *bufonites*, or toad-ſtones. The two bones that form the under jaw are united before by a looſe cartilage, ſerving by a free motion to the purpoſe of breaking, grinding, and comminuting its teſtaceous and cruſtaceous food, as crabs, lobſters, prawns, muſcles, &c. At the entrance of the gullet, above and below, are two very ſmall echinated bones. It has two fins, like wings, ſituated juſt under the gills ; and one long dorſal fin running from the head to the tail, and another reaching from the anus to the tail; the tail is round at its end, and conſiſts of thirteen rays. This fiſh grows to a large ſize, being ſometimes found on the Yorkſhire coaſt of the length of four feet, and near Shetland more than ſeven feet. Pennant.

LURA, in *Geography*, a town of South America, in the province of St. Martha, on the Madalena; 8 miles S. of Teneriffe.

LURBAH, a town of Bengal; 20 miles S.S.W. of Doeſa. N. lat. 22° 41′. E. long. 85°.

LURCH, To, in *Fencing*, is to make an opening in order to invite your adverſary to thruſt at you, when you, being ready, may find a favourable repoſt at him.

LURCHER, among *Sportſmen*, a kind of hunting dog, like a mongrel greyhound, with pricked ears, a ſhaggy coat, and generally of a yellowiſh-white colour. See Dog.

LURCY-le-Sauvage, in *Geography*, a town of France, in the department of the Allier, and chief place of a canton, in the diſtrict of Moulins; 7 miles E.N.E. of Donjon. The place contains 2461, and the canton 8548 inhabitants, on a territory of 265 kiliometres, in 12 communes.

LURE, in *Falconry*, a piece of red leather cut in form of a bird, with two wings ſtuck with feathers; and ſometimes baited with a piece of fleſh: wherewith to reclaim, or call back a hawk.

The word comes from the French *leurre*, which ſignifies the ſame: formed, according to Skinner, from the Anglo-Saxon, *læura*, *traitor;* or, according to Tripaud, from *leora*, *craſtineſs*. See Falcon and Hawking.

Lure, in *Geography*, a town of France, and principal place of a diſtrict, in the department of the Upper Saône, near the Ougnon. The place contains 1918, and the canton 12,339 inhabitants, on a territory of 227½ kiliometres, in 25 communes. N. lat. 47° 41′. E. long. 6° 34′.

LURGAN, a market and poſt-town of the county of Armagh, Ireland; it is in the north-eaſtern angle of the county, near Down, and conſiſts of one long wide ſtreet, remarkable for cleanlineſs. Its trade conſiſts in articles of the linen and muſlin manufactures, of which the weekly ſales are averaged from 2500*l.* to 3000*l.* Fine diapers for table linen manufactured in this town have been highly valued. Lurgan is 68 miles N. from Dublin.

Lurgan, a townſhip of America, in Franklin county, Pennſylvania, containing 758 inhabitants.

Lurgan *Green*, a ſmall poſt-town of the county of Louth, Ireland, pleaſantly ſituated on Dundalk-bay. It is on the great northern road, 37 miles N. from Dublin.

LURIDÆ, in *Botany*, from *luridus*, pale, livid, or ghaſtly, alluding to the livid and blueiſh aſpect, frequent in the tribe of plants thus denominated, which ſeems to announce their deadly effects on animal life. They conſtitute the 28th natural order, among the *Fragmenta* of Linnæus, and are exemplified by *Digitalis, Nicotiana, Atropa, Hyoſcyamus, Datura, Phyſalis, Capſicum, Solanum, Verbaſcum, Celſia, Lycium, Ceſtrum;* to which *Triguera* of Cavanilles, as well as *Witheringia* of l'Heritier, are properly added by Giſeke. But *Browallia, Elliſia, Strychnos, Ignatia,* and above all *Cateſbæa*, are with leſs reaſon referred hither by Linnæus.

The true *luridæ* have commonly a fetid herbage, though ſometimes a ſweet-ſmelling flower. They act powerfully upon the nerves, in whatever manner they are taken inwardly, and prove, under careful management, in ſome caſes, very valuable medicines, though naturally violent poiſons.

LURIGANCHE, in *Geography*, a town of Peru, in the juriſdiction of Lima.

LURIN, a town of Peru, in the juriſdiction of Lima.

LURKIAN, a town of Perſia, in the province of Chuſiſtan; 50 miles N. of Suſter.

LURY, a town of France, in the department of the Cher, and chief place of a canton, in the diſtrict of Bourges, ſituated on the Arnon; 13 miles W. of Bourges. The place contains 512, and the canton 4575 inhabitants, on a territory of 170 kiliometres, in 9 communes.—Alſo, a town of the iſland of Corſica; 13 miles N. of Baſtia.

LUS, St., a town of Mexico, in the province of Guatimala; 12 miles E. of Guatimala.

LUSATIA, a marquiſate of Saxony, bounded on the N. by the Mark of Brandenburg, on the E. by Sileſia, on the S. by Bohemia, and on the W. by Saxony; about 84 miles long, and 45 broad, divided into Upper and Lower Luſatia. The former abounds in mountains and hills, and enjoys a purer air than the latter, which is covered with a great number of woods. Peat and turf are found in different parts. Upper Luſatia is ill adapted to agriculture, but affords plenty of game. Lower Luſatia has heaths and fertile tracts. In both rye, wheat, barley, and oats are cultivated, together with buck wheat, peaſe, lintels, beans, and millet. Flax is alſo cultivated. As to orchard and garden fruits, and the culture of hops, tobacco, and wine, Lower Luſatia is preferable to the Upper. Neverthele ſs, the products of the country are not adequate to its conſumption, ſo that corn, fruit, hops, garden ſtuff, and wine, are imported into both theſe marquiſates. Cattle are bred in conſiderable number, and the rivers, lakes, and ponds afford various ſorts of good fiſh. In ſome parts are found pipemaker's clay, and ſtone quarries. Stones reſembling the Bohemian diamonds, agates, and jaſpers, and iron ſtone, are met with in ſeveral places: and here is a variety of medicinal ſprings. The chief rivers are the Spree, the Black Elſter, and the Pulſnitz. In Upper Luſatia are reckoned ſix towns, called "The Six Towns," 16 ſmaller towns, and four market towns; and in the Lower four towns, which appear at the land diets, 13 county towns, and two market ones. The firſt known inhabitants of this country were the Semnones, or Senones, who were ſucceeded by the Wandalers, and theſe again in the 7th century by a Sclavonian people, called the Sorber-Wends. In the 12th century the inhabitants of this country were intermixed by emigrants from the Low Countries and the Rhine. Some of the towns are now wholly peopled by Germans, but in the villages the Wends are more numerous than the Germans. Lutheraniſm was introduced into this country as early as the year 1521; it generally prevailed, and has been the permanent religion of the country. In 1750, the Hernhuters obtained protection as faithful ſubjects, and in conſequence of purchaſing ſeveral conſiderable eſtates, they have not only acquired civil power, but the patronage of churches. The inhabitants of Luſatia gain their ſubſiſtence by the manufacture of numerous woollen and linen ſtuffs; which moſtly flouriſh in Upper Luſatia. The manufactures of Luſatia have been promoted by the emigration of the Proteſtants, who were driven thither from Bohemia and Sileſia by the conduct of the emperors Ferdinand II. and III. and alſo of Leopold: and thus they have been extended, beyond cloth and linens of various ſorts, to thoſe of hats, leather, paper, gunpowder, iron, wax, glaſs, and wax-bleaching, and a variety of handicraft arts and operations. By theſe manufactures they have been enabled to carry on a trade, ſo that the commodities they diſpoſe of exceed thoſe which they import, which are wool, yarn, and ſilk, corn, fruit, hops, &c. The whole of Luſatia, except a ſmall part which is ſubject to Pruſſia, belongs to Saxony, having been ceded to the elector about the middle of the 16th century, in conſideration of a large ſum of money advanced by the elector to the emperor, in his war with the Bohemians.

LUSCHETZ, a town of Bohemia, in the circle of Schlan; 8 miles S.W. of Prague.

LUSCINIA, in *Ornithology*, a ſpecies of *Motacilla*, which ſee. See alſo NIGHTINGALE.—Alſo, a ſpecies of Certhia. See CERTHIA *Flaveola*.

LUSCINIOLA, the *Bogeuch* of Pennant, and *red warbler* of Latham. See MOTACILLA *Schœnobenus*.

LUSCINIUS, OTTOMARUS, in *Biography*, a Benedictine monk, born at Straſburg, but an inhabitant of Augſburg, publiſhed in 1536 a work, entitled "Muſurgia ſeu praxis Muſicæ," in ſmall oblong quarto; a book chiefly curious and valuable for the repreſentations of ſuch muſical inſtruments as were uſed in Germany at the time it was written, which, though coarſely cut in wood, are accurately drawn. There are, among keyed-inſtruments, the virginal, ſpinnet, and clavichord, all three in the form of a ſmall modern piano-forte; an upright harpſichord; a regal or portable organ, chiefly compoſed of reed-ſtops, and in Roman Catholic countries uſed in proceſſions; and a large or church-organ. Of bowed-inſtruments we have here only the monochord, rebec, or three-ſtringed violin, and the viol da gamba. The vielle, lute, harp, and dulcimer; cornet, ſchalmey, or baſe clarinet, both played with reeds; flutes of various ſize, among which is the Zwerchpfeiff, flute traverſiere, or, as we call it, the German flute; which accounts for its name, as we believe, at this early period, it was unknown to the reſt of Europe. There are four other wind-inſtruments, peculiar to Germany and northern countries, exhibited here: as, firſt, the ruſpfeiff, or Ruſſian flute; ſecond, the krumhorn, or crooked horn, a kind of ſhawm, in imitation of which we have a reed-ſtop in our old organs, called the cromhorn, which has by ſome been imagined to be a corruption of the word Cremona; third, gemſen horn, or wild goat's horn; and, fourth, the zincke, or ſmall cornet. After theſe we have the bag-pipe, trumpet, ſacbut, ſide-drum, kettle-drum, French-horn, bugle-horn, and even the Jews-harp, and clappers. Moſt of theſe inſtruments being in common uſe, and well known, need no repreſentation after the rude types of them given by Luſcinius, as they have been ſince much better delineated and engraved in Merſennus, Kircher, and in ſtill later muſical writers.

LUSEPARA, in *Geography*, an iſland that lies in the ſouth entrance of the ſtraits of Banca. S. lat. 3° 10′ 30″. E. long. 106° 15′.

LUSHBURGHS, or LUXENBURGHS, in our *Old Writers*, a baſe ſort of foreign coin, made of the likeneſs of Engliſh money, and brought into England in the time of Edward III. to deceive the king and his people: on account of which it was made treaſon, for any one willingly to bring any ſuch money into the realm, as knowing it to be falſe. Stat. 23 Edw. III. 3 Inſt. 1.

LUSIAD *of Camoens*. See CAMOENS.

LUSIGNAN, in *Geography*, a town of France, in the department of the Vienne, and chief place of a canton, in the diſtrict of Poitiers. The place contains 2390, and the canton 13,147 inhabitants, on a territory of 342½ kiliometres, in 10 communes. N. lat. 46° 26′. E. long. 0° 14′.

LUSIGNY, a town of France, in the department of the Aube, and chief place of a canton, in the diſtrict of Troyes. The place contains 1155, and the canton 7225 inhabitants, on a territory of 180 kiliometres, in 14 communes.

LUSITANIA, in *Ancient Geography*, one of the two provinces into which Hiſpania Ulterior was divided; the other being Bœtica. (See HISPANIA.) Its limits have been variouſly defined by different authors, and particularly by Pliny and Ptolemy. Strabo intimates, that this province extended from the Tagus to the Cantabrian ocean, or at leaſt the Promontorium Celticum. That part of it, ſituated betwixt the Anas and the Tagus, was denominated Celtica, or the country of the Celts. After Auguſtus made the diſpoſition of Spain, referred to under the article *Hiſpania*, the Anas bounded Luſitania on the ſouth, and the Durius on the north; ſo that the whole tract lying betwixt the Durius and the Cantabrian ocean was annexed to the Provincia Tarraconenſis. The interior limits of Luſitania, upon the frontiers of the Vettones and Carpetani, are differently fixed by different authors. The Luſitani poſſeſſed the diſtrict bordering upon the Atlantic ocean, and ſtretching itſelf from the mouth of the Anas to the Promontorium Sacrum, now known by the name of Cape St. Vincent. The ſituation of the Celtici, whoſe true name was Mirobrigenſes, according to Pliny, may be inferred from the preceding part of this article. Some of the ancient geographers make the Turduli and the Turdetani one nation, particularly Ptolemy and Strabo; though they were conſidered in a different light by Polybius. However this be, the Turdetani were undoubtedly a powerful people, ſince they occupied a conſiderable part both of Luſitania and Bœtica, as we learn from Strabo. The ſame may be ſaid of the Vettones, who ſpread themſelves over a large tract, terminated on the north by the Durius, and on the ſouth by the Tagus. Nevertheleſs, as the ancients differ with regard to the extent of territory every one of thoſe nations or cantons poſſeſſed, it is probable that their frontiers were not always the ſame. Some authors aſſert Vettonia, or the country of the Vettones, to have been a province diſtinct from Luſitania, and limited on the ſouth by the Anas; and this notion is countenanced by an inſcription in Gruter. The principal cities of this province are Barbarium Promontorium, Oliſippo, Tagi Fluvii Oſtia, Fortes Fluv., Lunæ Montis Promontorium, Mondæ Fluv. Oſtia, Vaci Fluv. Oſtia, Doriæ Fluv. Oſtia, Hannibal. Inland towns were Lavara, Aritium, Salium, Elbocoris, Araducta, Verarium, Velladis Æminium, Chretina, Arabriga, Scalabiſcus, Tacubis, Concordia, Talabriga, Langobriga, Mendeculia, Caurium, Turmogum, Burdua, Colernum, Iſallæcus, Ammæa, Ebura or Ebora, Norba Cæſarea, Liciniana, Auguſta Emerita, which was the capital, Evandria, Geræa, Cæcilia Gemittina, Capaſa, Conimbrica, Collipo, Bletiſa, Salmantica, Salatia, Pax Julia, and ſome others of leſs note. The chief promontories of Luſitania were the Promontorium Sacrum, or Cape St. Vincent; P. Barbarium, or Cape Spichel; and the P. Magnum, or Oliſiponenſe, denominated by ſome moderns Cape de Rocca Sintra; to which ſome add a fourth, called by Pliny Cuneus or the Wedge, ſuppoſed to be now known by the name of Cape St. Mary. The principal ports of this province were thoſe of Oliſippo or Liſbon, and Hannibal. The only iſland on the coaſt of Luſitania was the Londobris of Ptolemy, the Barlenga or Barlinges of the moderns. The only mountain of note in this country was the Mons Herminius of Hirtius, or the modern Arminno, ſince known by the name of Sierra de Eſtretta, running from north to ſouth, between the provinces of Beira and Tra los Montes. On the top are two extenſive and deep lakes, calm when the ſea is ſo, and rough when that is ſtormy. Theſe lakes are ſuppoſed to have ſome ſubterranean communication with the ocean. Herminius Minor is now Sierra de Marvao. The warlike inhabitants of the former were called Plumbarii, from their lead-mines and works. The moſt celebrated rivers of Luſitania were the Anas, now Guadiana, the Tagus or Tajo, and the Durius or Douro; to which may be added the Munda or Mondago, and the Vacus or Voga: all theſe flow from eaſt to weſt, and diſcharge themſelves into the Atlantic ocean. This province produced a conſiderable quantity of gold, particles of it being mixed with the ſand of the Tagus. The lead-mine of Medobriga or Meidobriga, at the foot of Herminius Minor, was famous.

The Luſitanians, according to Strabo, preferred exiſting upon the plunder of their neighbours to the improvement of their own lands, though the ſoil was naturally fertile and rich. In other caſes their manner of living was rude and ſimple. They uſed to warm themſelves by means of fire-ſtones made red-hot. They bathed in cold water, eat only of one diſh at a meal, and very ſparingly. Their dreſs was commonly black. They made no uſe of coin, but either bartered one commodity for another, or for ſome plates of ſilver, flatted with the hammer, and cut into pieces. They uſed, like the Egyptians, Gauls, and other ancient nations, to expoſe their ſick on the highways, that travellers might direct them to proper medicines for their cure. They were exceedingly robuſt, and ſo warlike that the Romans did not conquer them without great difficulty and length of time. See PORTUGAL.

LUSITANICA *Rubra Bolus*, is an impure earth, of a florid red colour, compact texture, and heavy: it colours the hands, and is very friable, readily diſſoluble in water, and raiſes with it a ſtrong ebullition; it melts readily in the mouth, has a ſtrong aſtringent taſte, is gritty, and adheres firmly to the tongue. It acquires hardneſs and a brighter colour by burning; it is of an alkaline quality; it is dug in the kingdoms of Portugal and Spain; it is alſo found near the Havannah and La Vera Cruz in New Spain. It has been eſteemed a very valuable aſtringent, and an effectual remedy for fluxes and other diſtempers of that kind. It has been alſo accounted alexipharmic by the Spaniards and Portugueſe. They make an earthen ware of this bole, which they call bucaros: the ware is of a fine red colour, ſmooth, and poliſhed, though it is merely dried, and not glazed. They uſe it to filtre, cleanſe, and cool the water. Veſſels of the ſame kind are alſo brought from the Havannah and Vera Cruz.

LUSK, in *Geography*, a fair-town in the county of Dublin. Ireland. According to Archdell, an abbey was founded here in the firſt ages of Chriſtianity; and there is adjoining the angle of the ſteeple of the church, one of thoſe ancient round towers ſo peculiar to Ireland: it is in good preſervation, and riſes ſeveral feet above the battlements of the ſteeple. It is 11 miles N. by E. from Dublin.

LUSPA, a town of Sweden, in Eaſt Bothnia; 28 miles E. of Chriſtineſtadt.

LUSSAC, a town of France, in the department of the Gironde, and chief place of a canton, in the diſtrict of Libourne; 6 miles E.N.E. of Libourne. The place contains 2032, and the canton 9072 inhabitants, on a territory of 157½ kiliometres, in 16 communes.—Alſo, a town of France, in the department of the Vienne, and chief place of a canton, in the diſtrict of Montmorillon; 6 miles W. of Montmorillon. The place contains 1379, and the canton 9470 inhabitants, on a territory of 400 kiliometres, in 13 communes.

LUSSAN, MARGARET DE, in *Biography*, was born at Paris in 1682. Her parents were in the lower rank of life; the mother being a fortune-teller, and the father a coachman. She, by ſome means, attracted the notice of the learned Huet, who, ſtruck with the vivacity of her temper, encouraged her to write romances. She derived great advantage in the formation of her taſte, from her connection with la Serre de Langlade, to whom ſhe was much attached; but the love was not mutual: her charms were wholly mental; her perſon and manners were even forbidding; but ſhe was generous, humane, and conſtant in her friendſhips. She died at the age of 75. Her works are "L'Hiſtoire de la Comteſſe de Gondès," "Anecdotes de la Cour de Philippe Auguſte," "Memoires Secrets et Intrigues de la Cour de France ſous Charles VIII.," "Marie d'Angleterre," "Annales de la Cour de Henri II.," "La Vie du brave Crillon."

LUSSAN, in *Geography*, a town of France, in the department of the Gard, and chief place of a canton, in the diſtrict of Uzès; nine miles N. of Uzès. The place contains 997, and the canton 5493 inhabitants, on a territory of 239 kiliometres, in 13 communes.

LUSSEMEN, a town of Pruſſia, in the province of Ermeland; 18 miles E.S.E. of Heilſberg.

LUST, at *Sea*. If a ſhip heel either to the ſtar-board or port, the ſeamen ſay ſhe hath a *luſt* that way; and they ſay ſo though it be occaſioned only by the ſhooting of her ballaſt, or by the unequal ſtowing of things in the hold; though it is more properly ſaid of a ſhip, when ſhe is inclined to heel any way upon account of her mould or make.

LUST-*wort*, in *Botany*. See SUN-*dew*.

LUSTER, or LUSTRE, gloſs, or brightneſs appearing on any thing; particularly on manufactures of ſilk, wool, or ſtuff.

LUSTER is alſo uſed for a certain compoſition, or manner of giving that gloſs or brilliance.

The luſtre of ſilks, in which their chief beauty conſiſts, is given them by waſhing in ſoap, then clear water, and dipping them in alum-water cold.

The luſtre of black taffety is given by double-brewed beer, boiled with orange or lemon-juice; that of coloured taffetas with water of gourds, diſtilled in an alembic. Curriers give a luſtre, or gloſs to the leather ſeveral ways, according to the colour to be illuſtrated. For blacks, the firſt luſtre is with juice of barberries; the ſecond with gum arabic, ale, vinegar, and Flanders glue, boiled together: for coloured leathers they uſe the white of an egg beaten in water: moroccos have their luſtre from juice of barberries, and lemon or orange.

For hats, the luſtre is frequently given with common water; ſometimes a little black dye is added. The ſame luſtre ſerves ſkinners, except that in white furs they never uſe any black dye. For very black furs they ſometimes prepare a luſtre of galls, copperas, Roman alum, ox's marrow, and other ingredients.

The luſtre is given to cloths and mohairs, by preſſing them under the calender.

LUSTER, an appellation given to a branched candleſtick, when made of glaſs. See BRANCH and JESSE.

LUSTIG, JACOB WILHELM, in *Biography*, organiſt of St. Martin's church in Groningen, publiſhed, in 1771, in the Dutch language, "An Introduction to the Art of Muſic, 2d edition, corrected and enlarged," 8vo. This introduction is better digeſted, and more abundant in uſeful information, than the generality of elementary treatiſes. The author had read, meditated, and ſtudied muſic regularly, both in theory and practice; and was a good compoſer of the old ſchool. He had been a diſciple both of Mattheſon and Telemann. We have ſeen a book of leſſons of his compoſition, which has great merit. In this book we found the croſs-hand jig, in $\frac{12}{8}$, which the little Frederica, afterwards Mrs. Wynne, and other infant performers, uſed to play at the end of a minuet of Tartini with variations by Paradies, generally known by the name of Paradies' minuet. In 1772 we had the pleaſure of converſing with this worthy profeſſor (Luſtig), and of hearing him play on the organ of St. Martin's church in Groningen, of which he had been organiſt 44 years; ſtill retaining his hand, and, a few allowances made for change of taſte and ſtyle, he was ſtill a very able and good organiſt.

LUSTRAL, an epithet given by the ancients, to the water uſed in their ceremonies, to ſprinkle and purify the people. From hence the Romaniſts have borrowed the holy water uſed in their churches.

Lustral *day*, *dies Luſtricus*, that whereon the luſtrations were performed for a child, and its name given; which was uſually the ninth day from the birth of a boy, and the eighth from that of a girl. Though others performed the ceremony on the laſt day of that week wherein the child was born, and others on the fifth day from its birth.

Over this feaſt day the goddeſs Nundina was ſuppoſed to preſide; the midwives, nurſes, and domeſtics, handed the child backwards and forwards, around a fire burning on the altars of the gods, after which they ſprinkled it with water; hence this feaſt had the name of Amphidromia. The old women mixed ſaliva and duſt with the water. The whole ended with a ſumptuous entertainment. The parents received gifts from their friends on this occaſion. If this child was a male, their door was decked with an olive-garland: if a female with wool, denoting the work about which they were to be employed. Potter.

LUSTRATION, Expiation, in *Antiquity*, ſacrifices or ceremonies, by which the Romans purified their cities, fields, armies, or people defiled by any crime, or impurity. Some of the luſtrations were public, others private.

There were three ſpecies, or manners of performing luſtration; *viz.* by fire and ſulphur; by water; and by air; which laſt was done by fanning and agitating the air round the thing to be purified.

There was alſo a peculiar kind of luſtration for young children.

Lomier has a volume expreſs on the luſtrations of the ancients: Joh. Lomieri Zutphanenſis Epimenedes, ſive de veterum Gentilium Luſtrationibus; firſt printed at Utrecht in 1681, and ſince, with additions, in 1702, 4to.

All perſons, ſlaves only excepted, he ſhews, were miniſters of ſome ſorts of luſtration. When any one died, the houſe was to be ſwept after a particular manner, by way of purification; the prieſt threw water on new married people, with the like intention. To purify themſelves, people would even ſometimes run naked through the ſtreets; ſuch was their extravagance. And, as if fancy was not fertile enough in inventing modes of luſtration, they even uſed inchantments to raiſe the dead, in order to get inſtructions what they muſt do to purge themſelves of their ſins. Add, that they frequently raiſed the opinion of the ſanctity of their expiations by fictitious miracles.

It was common, on theſe occaſions, to ſhed human blood: the prieſts of Cybele, Bellona, and Baal, made cruel inciſions on themſelves. Erectheus, king of Attica, ſacrificed his daughter to Proſerpina. Several had their throats cut at Rome, to obtain the emperor's health from the gods. Thoſe who commanded armies offered one of their ſoldiers to appeaſe the anger of the gods; that he alone might ſuffer all the wrath the army deſerved.

All ſorts of perfumes, and odoriferous herbs, had place in luſtration. The egg was much uſed among them, as being the ſymbol of the four elements; its ſhells, they ſay, repreſent the earth; the yolk, a globe of fire; the white, reſembles the water; and beſides it has a ſpirit, they ſay, which repreſents the air. For this reaſon it is, that the bonzes, or Indian prieſts, believe to this day that the world came out of an egg. There is ſcarce any pot-herb, pulſe, tree, mineral, or metal, which they did not offer the gods by way of expiation: nor did they forget milk, bread, wine, or honey; what is more, they made uſe of the very ſpittle, and urine.

The poets had feigned, that the gods purified themſelves, and they did not omit to purify their ſtatues. They made luſtration for children the eighth day after their birth. When a man who had been falſely reputed dead, returned home, he was not to enter his houſe by the door. It was a ſettled cuſtom to offer no expiation for thoſe who were hanged by order of juſtice; or that were killed by thunder. Neither did they offer any for thoſe who were drowned in the ſea; it being the common opinion, that their ſouls periſhed with their bodies. And hence it was, that perſons in danger of ſhipwreck, ſometimes thruſt their ſwords through their bodies, that they might not die in the ſea; where they thought their ſoul, which they ſuppoſed to be a flame, would be totally extinguiſhed. The moſt celebrated expiatory ſacrifice was the hecatomb, when they offered a hundred beaſts; though they commonly did not offer ſo many, but contented themſelves with killing twenty-five; but thoſe being quadrupeds, their feet came to an hundred.

The manner of the Macedonians purifying their army by luſtration was this; at the time of their feſtival Xanthica, they divided a bitch into two halves, one of which, together with the entrails, was placed upon the right hand, the other upon the left; between theſe the army marched in this order: after the arms of the Macedonian kings, came the firſt line of the army, conſiſting of horſe; theſe were followed by the king, and his children, after whom went the life guards; then followed the reſt of the army: this done, the army was divided into two parts, one of which being ſet in array againſt the other, there followed a ſhort encounter in imitation of a fight. Potter, Archæol. Græc. lib. ii. c. 20. tom. i. p. 417.

Luſtrations, and luſtratory ſacrifices, were not only performed for men, but alſo for temples, altars, theatres, trees, fountains, rivers, ſheep, fields, and villages. When the Arval brothers offered a victim for the fields, their ſacrifice was called *ambarvalia*.

Cities were alſo to be purified, from time to time: ſome made the victim walk round their walls, and then ſlew him. The Athenians ſacrificed two men, one for the men of their city, and the other for the women. The Corinthians ſacrificed the children of Medea ſo: though the poets ſay, Medea killed them herſelf. The Romans performed the ceremony of purifying their city every fifth year; whence the name of luſtrum was given to the ſpace of five years.

Divers of the expiations were auſtere: ſome faſted; others abſtained from all ſenſual pleaſures; ſome, as the prieſts of Cybele, caſtrated themſelves; others, that they might live chaſte, eat rue, or lay under the branches of a ſhrub called *agnus caſtus*.

They caſt into the river, or at leaſt out of the city, the animals or other things that had ſerved for a luſtration, or ſacrifice of atonement; and thought themſelves threatened with ſome great misfortune, when by chance they trod upon them. At Marſeilles, they took care to feed a poor man for ſome time; after which, they charged him with all the ſins of the country, and drove him away: thoſe of Leucade faſtened a number of birds to a man charged with their ſins, and in that condition caſt him headlong from a high tower; and if the birds hindered his being killed, they drove him out of the country.

Some of theſe ceremonies were aboliſhed by the emperor Conſtantine, and his ſucceſſors; the reſt ſubſiſted till the Gothic kings were maſters of Rome, under whom they expired; except that ſeveral of them were adopted by the popes, and brought into the church, where they make a figure to this day: witneſs the numerous conſecrations, benedictions, exorciſms, ablutions, ſprinklings, proceſſions, feaſts, &c. ſtill in uſe in the Roman church.

LUSTRINGS. A company was incorporated for making, dreſſing, and luſtrating alamodes and luſtrings in England, who were to have the ſole benefit thereof, by ſtat. 4 and 5 W. and M. And no foreign ſilks known by the name of luſtrings or alamodes are to be imported, but at the port of London, &c. Stat. 9 and 10 W. III. c. 43. See Silk.

LUSTRUM, a term uſed by the Romans, to ſignify a ſpace of five years.

Varro derives the word from *luo, to pay*; becauſe at the beginning of every fifth year they paid the cenſus, or tribute impoſed by the cenſors; whoſe authority, at their firſt inſtitution, was continued them for five years; though afterwards it was abridged to one. Others rather derive the word from *luſtrare, to make a review*; becauſe once in five years the cenſors reviewed the army.

Lustrum was alſo a ceremony, or ſacrifice uſed by the Romans, after numbering their people, once in five years. See Lustration.

The cenſus was accompanied always by a luſtration of the people, ſo the word luſtrum has conſtantly been taken by the ancients and moderns for a term of five years: yet if we enquire into the real ſtate of the caſe, we ſhall find no good ground for fixing ſo preciſe a ſignification to it; but, on the contrary, that the cenſus and luſtrum were, for the moſt part, held irregularly and uncertainly, at very different and various intervals of time, as the particular exigencies of the ſtate required. Middlet. of Rom. Sen. p. 107.

LUTANGER, in *Geography*, a ſmall iſland in the Eaſt India ſea, near the S. coaſt of Mindanao. N. lat. 7° 19′. E. long. 123° 15′.

LUTATION, in *Chemiſtry*, is uſed for the cementing of chemical veſſels cloſe together.

LUTAYA, in *Geography*, one of the ſmaller Philippine iſlands, near the iſland of Panay.

LUTE, Lutum, in *Chemiſtry*, a compoſition of certain tenacious ſubſtances, wherewith to cloſe the apertures and junctures of veſſels in diſtillation, &c. See Cæment, Cement, and Mortar.

Lute, *Leuto*, Ital., *Laute*, Germ., a muſical ſtringed inſtrument, of which, though the ſhape or ſound is now hardly known, yet during the ſixteenth and ſeventeenth centuries it was the favourite chamber inſtrument of every nation in Europe, and in the beginning of dramatic muſic the recitatives were accompanied by the arch-lute, or theorbo, inſtead of the harpſichord.

Sir Thomas Wyat, the elder, one of our beſt early poets, has left us a ſonnet to his lute, written very early in the ſixteenth century; and Congreve, at the end of the ſeventeenth, has celebrated the performance of Mrs. Arabella Hunt on that inſtrument.

The earlieſt mention of the lute that we have found among the moderns is in Boccaccio, *Giornata prima*, where the ſinging is generally ſaid to have been accompanied by the lute. In Chaucer's Pardoner's tale, we are told:

"In Flanders whilom was a compagnie
Of yougè folk that haunted in folie,
As hazard, riot, ſtewès and tavèrnes
Whereas with harpès, lutès, and guitèrnes,
They daunce and play."

In Shakſpeare's firſt part of Henry IV. Mortimer tells his lady, who can ſpeak no Engliſh, that her tongue

"Makes Welſh as ſweet as ditties highly penn'd,
Sung by a fair queen in a ſummer's bower,
With raviſhing diviſion to her lute."

And in lord commiſſioner Whitelocke's MS. narrative of a maſque given in 1633, to Charles I. and his queen, by the four inns of court, he ſays, that "he engaged forty lutes, beſides other inſtruments and voyces of the moſt excellent kind in conſorte."

There was a lute at the Italian opera in England, to the end of Handel's regency. And the place of luteniſt in the king's chapel was continued till the death of Giglier, about the middle of the laſt century.

It ſeems as if in France there had been a time when there was no other inſtruments in uſe than lutes, as *luthier* not only implies the maker of lutes, but violins, violoncellos, and other inſtruments of the ſame kind.

There has been no ſatisfactory etymology given to the word lute, though Scaliger and Bochart have tried to find or frame one, deriving it from the Arabic *allaud*, whilſt others have derived it from the German *laute*, or *lauten*, ſonare.

The ſtringed inſtruments of the ancients were ſo numerous, and ſo various in their forms, that we know not the preciſe difference between the lyre and cithara. The teſtudo, among poets, not only implies the lyre, ſaid to have been originally made by Mercury of the back or hollow ſhell of the *teſtudo aquatica*, or ſea tortoiſe, but muſic itſelf.

As to the different names that may have been given to the ſame kind of inſtrument by the ancients, ſuch as φορμιγξ, χελυς, teſtudo, cithara, &c. we ſhall leave the diſpute, ſays Merſennus, to grammarians, who may conſult Athenæus, Julius Pollux, Ariſtides, Quintilianus, and other Greeks; for ſince we are in poſſeſſion of the inſtrument, they may give it what name they pleaſe.

Vincenzo Galileo (Dial.) ſays the beſt lutes were made in England.

The lute conſiſts of four parts, the table, the body or belly, which has nine or ten ſides, the neck or finger-board, which has nine or ten frets or diviſions marked with catgut or bowel ſtrings, and the head or croſs, where the ſcrews or pins for tightening or relaxing the ſtrings in tuning are faſtened. This is called the lute with two necks, or the theorbo, which has ſometimes only one ſtring to each note. In the middle of the belly or table, there is a roſe or paſſage for the ſound. There is alſo a bridge, to which the ſtrings are faſtened, and a piece of ivory between the head and the neck, to which the other extremities of the ſtrings are fitted.

In performing on the lute, the ſtrings are ſtruck with the right hand, and preſſed upon the frets with the left.

Whoever wiſh to teach themſelves to play upon this inſtrument, as it will be difficult now to find a good maſter, may attain conſiderable knowledge in the practice of it by a peruſal of Père Merſenne's Harmonie Univerſelle, printed at Paris in 1636, folio, livre ii. des Inſtrumens, p. 45; and Mace's Muſick's Monument, folio, 1676, Graſſineau. This laſt book is written in a ſtyle amuſingly quaint; but it probably contains all the eſſential rules known at the time it was written, both for playing, judging of the goodneſs of the inſtrument and ſtrings, placing the frets, &c. But after the deceaſe of honeſt Thomas Mace, whoſe ſtyle much reſembles that of Anthony Wood, though he exceeds him in quaintneſs and ſimplicity, there were probably many refinements diſcovered by great players, both in compoſing for the inſtrument and in performing upon it, which are now quite loſt.

The inhabitants of Congo have a lute of a ſingular kind. The body and neck of this inſtrument reſemble ours; but the belly, that is, the place where the roſe or ſound-hole has place in our lutes, is of very thin parchment; which probably implies that the whole table or belly of this inſtrument is covered with parchment inſtead of wood. It is ſtrung with the hair of an elephant's tail, the ſtrongeſt and the beſt that can be choſen; or elſe with the bark of the palm-tree. The ſtrings reach from one end of the inſtrument to the other, and are faſtened to rings fixed at different places of the lute one above the other. To theſe rings are ſuſpended ſmall plates of iron and ſilver of different ſizes and different tones. In thrumming the ſtrings theſe rings are put in motion, which likewiſe move the little metal plates, and the whole forms a kind of murmuring harmony, or rather a confuſed noiſe, which is pretended not to be diſagreeable. The inhabitants likewiſe add, that in thrumming the ſtrings of this inſtrument in the way we produce ſound from the harp, the muſician expreſſes his thoughts as clearly as if he were ſpeaking. Encycl. Suppl. folio.

Lute, *Archi.* See Arciluto.

Lute, *Theorbo.* See Theorbo.

LUTEA, in *Natural Hiſtory*, the name of a ſpecies of fly found frequently near waters after rain; it is of a duniſh-yellow colour, the wings are long, and the eyes large and prominent; the tail is thick, and has two hairs of a conſiderable length growing at the head, ſo that it is of the biſetæ kind.

Lutea is alſo a name by which ſome authors have called the yellow-hammer. See Emberiza *Citrinella.*

LUTEEFGUR, in *Geography*, a town of Hindooſtan, ſituated in a paſs between the mountains of Benares, where the air is very inſalubrious; 15 miles S.E. of Chunar.

LUTEOLA, in *Botany*, the herb Weld, Dyer's-weed, or Yellow-weed, ſo called from *luteus*, yellow, becauſe it is of very general uſe in various countries for giving that colour to woollen cloth or yarn. See Reseda.

Luteola, in *Ornithology*, a name given by many to a ſmall bird, the Motacilla *Trochilus* of Linnæus (which ſee), called by others *aſilus*, and by others *regulus non criſtatus*; but this laſt is a name that has occaſioned ſome confuſion, as many have erroneouſly called our common wren the *regulus*, and as it has no creſt, imagined it to be the bird meant by this name.

It is, excepting the creſted wren, the ſmalleſt of all European birds, and it very little exceeds that in ſize; its head, neck, and back are of a greeniſh-brown; the rump is greener than the reſt; it has a yellow line on each ſide, extended from the noſtrils, beyond the eyes, to the hinder part of the head; the breaſt, throat, and belly are yellow, with a very faint caſt of green; the wings and tail are brown, and all their feathers are tipped with green at their ends; the under part of the wings has much of a very fine green; the beak is extremely ſlender, and half an inch long; the mouth is yellow within; it makes a loud noiſe, like that of a graſshopper, and is principally found among willows; it is continually creeping and ſinging among the branches of trees; it builds with ſtraw and feathers, and lays five eggs, which are white, and ſpotted with red: there is a conſiderable variation in the colours of theſe birds; ſome of them being much greener on the back, and much whiter on the belly than others.

LUTEREE, in *Geography*, a town of Hindooſtan, in Lahore; 33 miles N. of Jummoo.

LUTHER, Martin, in *Biography*, the celebrated author of the Reformation in Germany, deſcended from parents in very humble circumſtances, was born at Eiſleben, in Saxony, in the year 1483. He diſcovered an early inclination for learning, and having attained the rudiments of grammar under his father's roof, he was ſent to ſchool at Magdeburg, where he continued only about a year, and during that ſhort period he ſupported himſelf, like many other poor German ſcholars, by literally begging his bread. From Magdeburg he went to Eiſenach, in Thuringia, and diſtinguiſhed himſelf in a ſchool of high reputation, by his diligence and proficiency. In 1501 he was entered at the univerſity of Erfurt, and in a very ſhort time, having a mind ſuperior to the ſcholaſtic modes of inſtruction then in uſe, he became diſguſted with thoſe ſubtile and uninſtructive ſciences. He immediately applied himſelf with the greateſt ardour and aſſiduity to the works of the ancient Latin writers, ſuch as Cicero, Virgil, Livy, Salluſt, &c. and ſuch was the ſucceſs with which he ſtudied, that he became the object of admiration to the whole univerſity. He took his degree of M.A. when he was ſcarcely twenty years of age, and immediately afterwards began to read lectures on Ariſtotle's phyſics, on ethics, and other branches of philoſophy. He began now to conſider the profeſſion which he ſhould adopt for his ſupport in life, and, by the perſuaſion of his friends, he turned his attention to juriſprudence; but an accident, to which he was witneſs, *viz.* the death of a friend by the diſcharge of a thunder-cloud, ſo ſenſibly affected him, that he determined to retire from the world into a convent of the Auguſtine friars. No entreaties on the part of his friends could divert him from his plan, which he conceived to be a duty that he owed to God, and accordingly aſſumed the habit of that order. He now applied himſelf very diligently to the ſtudy of theology, and turned his mind ſo eagerly to the reading of the Latin bible, which he had met with by accident, as to excite the moſt lively emotions of ſurpriſe and aſtoniſhment among the monks, who were little accuſtomed to derive their notions concerning religion from that ſource. Having paſſed a year in the monaſtery of Erfurt, he took the vows, and was, in 1507, admitted to prieſts' orders. His great and profound learning, the ſanctity of his moral conduct, and his extenſive knowledge of the holy ſcriptures, were generally known and applauded; and in the following year, Frederick, elector of Saxony, having lately founded an univerſity at Wittemburg, appointed Luther to the profeſſorſhip of philoſophy, and afterwards that of divinity. The duties attached to theſe offices he diſcharged with ſo much ability, and in a method ſo totally different from the uſual mechanical and dull forms of lecturing, that he was crowded with pupils from all quarters, and was regarded as the chief ornament of the univerſity. In 1510, Luther was ſent to Rome by the monks of his order, to get ſome diſputes between them and their vicar-general ſettled by his holineſs the pope. While in that city, he made his obſervations on the pope and the government of the church of Rome; he examined the manners of the clergy, which he ſeverely cenſured, particularly as to the haſty and ſlovenly method which they adopted in performing divine ſervice. The careleſſneſs with which they were accuſtomed to offer up their prayers to Almighty God, he declares excited in his breaſt ſentiments of aſtoniſhment and horror. As ſoon as he had accompliſhed the object of his miſſion he returned to Wittemburg, where, in 1512, he had the degree of doctor of divinity conferred upon him, at the expence of Frederick, elector of Saxony, who frequently attended his pulpit diſcourſes, and was as delighted with his eloquence as ſatisfied with his extraordinary merits. Luther was, at firſt, deſirous of declining the honour offered him, conſidering himſelf too young for ſuch a diſtinction, but his objections were over-ruled, and he was told "that he muſt ſubmit to be thus dignified, inaſmuch as the Almighty had important ſervices to be performed in the church, and through his inſtrumentality." Little did they, who made uſe of this expreſſion, whether in a tone of ſeriouſneſs or levity, imagine how truly its prophetic language ſhould be verified, and how extenſively uſeful his future labours ſhould be, in clearing away the corruptions that had almoſt overwhelmed the Chriſtian world, as it was then called; for real Chriſtianity, as dictated by its meek and holy founder, was as difficult to be diſcerned in the age preceding the great reformer, as it was among the moſt barbarian nations devoted to the ſuperſtitions and idolatry of Greece and Rome.

Under the article Reformation, we ſhall endeavour to exhibit, in its true colours, the ſtate of the papal dominion and church, both with reſpect to the people and clergy, as it exiſted when Luther began his labour; to develope the cauſes which produced ſo important a change in the world; and trace its conſequences with regard to mankind. In the preſent article we ſhall more particularly confine ourſelves to the life and labours of Luther himſelf.

This great man, almoſt as ſoon as he was created doctor of divinity, felt it incumbent on him to ſhew that the title and honour had not been conferred without reaſon. He applied himſelf with all diligence to the duties of the theological chair. He read lectures on the ſeveral books of the ſcriptures. He commented on the epiſtle to the Romans and on the book of Pſalms, and his illuſtrations were ſo ſtriking, that, by the thoughtful and the ſerious, he was regarded as the harbinger of a new day ready to break out after a long night of darkneſs and ignorance; and he led multitudes to think and to reaſon on matters of high importance who had never reflected or thought before beyond the concerns of the preſent world. He oppoſed, with a vehemence that could ſcarcely be withſtood, the errors which had been long current in the church and the ſchools, as truth, ſhewing that the ſcriptures were the only teſt of ſound doctrine and practical morality. He applied himſelf diligently to the ſtudy of the ſcriptures, in their original languages, and encouraged the cultivation of theſe languages in the univerſity, as the only ſure foundation on which a proper knowledge of religion could be built. Luther was a ſtrict diſciplinarian in the college, but he exacted no more from the young men under his inſpection than he ſhewed himſelf an example of in his own moral conduct; and thus, by uniting a practical regard to religious duties, with an earneſt zeal in enforcing them upon the minds of others, he contributed, in an eminent degree, to raiſe the univerſity of Wittemburg to a high degree of reputation, which amply gratified the elector for his munificence in founding it. He had himſelf been early initiated in the Peripatetic philoſophy, then univerſally taught in the ſchools; but his eyes were ſoon opened to its numerous defects and ſilly ſubtleties, and while a profeſſor at Wittemburg, in 1516, he wrote to Jodocus, a zealous Ariſtotelian, who had been his preceptor at Erfurt, ſtating at firſt only his doubts reſpecting the doctrines in which he had been inſtructed, and which, in his turn, it was expected he ſhould teach others. Jodocus, wholly unprepared for ſuch remarks, made with firmneſs, mingled with modeſty, was highly incenſed againſt the author of them, and in his next viſit to Urfurt refuſed to ſee him. Luther had not a mind to be intimidated: even the reſpect which he felt for the inſtructor of his early years forbad him to recede a ſingle ſtep; he had ſet his hands to the plough, and could not look back; he had embarked in the cauſe of reform, and muſt neceſſarily advance, notwithſtanding the difficulties that might be oppoſed to him by his deareſt friends. He accordingly wrote a ſecond letter to Jodocus, in which he gave it as his decided opinion, grounded upon indiſputable evidence, that it would be impoſſible to reform the church, without entirely aboliſhing the canons and decretals, and with them the ſcholaſtic theology, philoſophy, and logic, and inſtituting others in their ſtead.

In early life, Luther, whoſe comprehenſive mind could graſp all ſubjects, had ſtudied the writings of St. Auguſtine, Thomas Aquinas, Duns Scotus, and other celebrated ſchoolmen; and in the diſpute concerning Univerſals, attached himſelf to the party of the Nominaliſts, but maturer age and reflection inſtructed him to treat the whole controverſy with contempt. This has been referred chiefly to his early acquaintance with the ancients, but it was probably owing rather to that peculiar ſtrength and ardour of mind which led him eaſily to diſcover the abſurdity of the prevailing modes of reaſoning, and of judging upon theological and philoſophical ſubjects, and to obſerve with regret and indignation the fatal effects of corrupt philoſophy united with eccleſiaſtical tyranny. Under the article Leo X. we have alluded to the general ſale of indulgences publiſhed by that pontiff: this proved the firſt link in a chain of cauſes which produced a revolution in the ſentiments of mankind, the greateſt, as well as the moſt beneficial that has happened ſince the publication of Chriſtianity. When Leo was raiſed to the papal throne, he found the revenues of the church exhauſted by the vaſt projects of his predeceſſors: he felt no deſire to purſue a ſyſtem of economy; his heart, as we have ſeen, (ſee Leo X.) was intent on aggrandizing his family: to this may be added his love of ſplendour, his taſte for pleaſure, and his munificence in rewarding men of genius and merit, all which involved him in new expences; in order to provide a fund for which, he tried every device that himſelf and friends could invent, to drain the credulous multitude of their wealth. Hence the ſale of indulgences, which pretended to convey to the poſſeſſor, either the pardon of his own ſins, or the releaſe of any one, already dead, in whoſe happineſs he was intereſted, from the pains of purgatory. Leo had not, however, the credit of the invention of this ſyſtem; it may be referred back to the papacy of Urban II., in the eleventh century, who had contrived the lucrative trade, in order that the pope might have the means of recompenſing thoſe who went to join the army of the cruſaders in the Holy Land. They were afterwards granted to thoſe who, being unwilling to ſerve themſelves, hired a ſoldier for that purpoſe, and in a ſhort time they were beſtowed on ſuch as gave money for accompliſhing any pious work enjoined by the holy pontiff.

Julius II. had beſtowed indulgences on all who contributed towards building the church of St. Peter at Rome, which, as we have ſeen, was begun while he ſat upon the papal throne, and as Leo was carrying on that expenſive building, his grant was founded on the ſame pretence. The right of promulgating theſe indulgences in Germany, together with a ſhare in the profits ariſing from the ſale of them, was granted to Albert, elector of Mentz, and archbiſhop of Magdeburg, who, as his chief agent for retailing them in Saxony, employed Tetzel, a Dominican friar of licentious morals, who executed his commiſſion with great zeal and ſucceſs, but without regard to any principles of prudence or decency. At length the trade was carried on with ſo little attention to the intereſts of ſociety, that it became a general wiſh that ſome check ſhould be given to it. Luther was not an inattentive ſpectator: he beheld, with concern and indignation, the artifices of thoſe who ſold, and the folly or ſimplicity of thoſe who purchaſed indulgences. Having examined the ſubject, and finding that the practice derived no countenance from the ſcriptures, he determined openly to proteſt againſt ſuch ſcandalous impoſitions on his deluded countrymen.

In the year 1517, he attacked, with all the vehemence in his power, from the pulpit, in the great church of Wittemburg, the vices of thoſe very monks who dared openly to diſtribute indulgences: he tried their doctrines by the ſtandard of ſcripture, and exhorted his hearers to look for ſalvation to the means appointed by God in his holy word. The boldneſs and fervour with which he uttered his exhortations did not fail to make a deep and laſting impreſſion on the people, who, ſuſpecting the deluſions to which they had been long ſubject, were ready to join any perſon, eſpecially one whoſe character for integrity ſtood ſo high as Luther's, in throwing off a yoke which they were ſcarcely able to endure. Luther was not content with undeceiving the perſons who crowded round his pulpit; he advanced with dignity to a higher authority; he wrote to Albert, elector of Mentz, and archbiſhop of Magdeburg, remonſtrating againſt the falſe opinions, as well as the wicked lives, of the defenders and diſtributors of indulgences, intreating him, in a moſt ſupplicatory tone, to exerciſe the authority veſted in him for correcting theſe evils. The archbiſhop was, however, too deeply intereſted in theſe abuſes to lend a hand in putting an end to them. In addition to his letter, Luther tranſmitted to the prelate ninety-five theſes, which he had propoſed as ſubjects of inquiry and diſputation, and which he had publicly fixed in a church at Wittemburg, with a challenge to the learned to oppoſe on a given day, either in perſon or by writing; and to the whole he added a ſolemn proteſtation of his profound reſpect for the apoſtolic ſee, and implicit ſubmiſſion to its authority. On the appointed day no perſon appeared to conteſt Luther's theſes, which rapidly ſpread all over Germany, and excited univerſal admiration of the boldneſs which he diſcovered in venturing to call in queſtion the papal power and authority, and to attack the Dominicans, armed, as they were, with all the terrors of the inquiſitorial authority. The friars of his own order were delighted with his invectives againſt the monks who ſold indulgences, and were anxious to ſee them expoſed to the hatred and ſcorn of the people; and he was ſecretly encouraged in his proceedings by his ſovereign, the elector of Saxony, who thought they might contribute to give ſome check to the exactions of the court of Rome, which the ſecular princes had been long unſucceſsfully endeavouring to oppoſe. The publication of Luther's theſes brought into the field many zealous champions in defence of the holy church, who were leſs eager for the diſſemination of the truth, than for the profits which exiſting abuſes afforded them, and who accordingly traduced the character of Luther, endeavouring to excite the indignation of the clergy and populace againſt him. Luther, however, was not to be terrified by any meaſures which his preſent adverſaries could adopt: he found a large body of the people adhering to his doctrines, and he was content, in their behalf, to go through evil report as well as good report: he even went ſo far, in a public declaration, as to ſay, "that if the pope and cardinals entertained the ſame opinions with his opponents, and ſet up any authority againſt that of ſcripture, there could be no doubt but that Rome was itſelf the very ſeat of antichriſt, and that it would be happy for thoſe countries which ſhould ſeparate themſelves from her."

It does not appear that, at this early period, Luther had any intention of ſetting himſelf againſt the power of the pope; he even wrote a letter to his holineſs in the moſt reſpectful terms, ſhewing the uprightneſs of his intentions, and the juſtice of the cauſe of which he was the advocate. Shortly after this, by the inceſſant repreſentations of Luther's adverſaries, that the heretical notions he was propagating threatened the moſt fatal miſchiefs to the intereſts of the church, Leo iſſued an order for his appearing at Rome to juſtify himſelf. The judges of his conduct were already appointed and ſelected on account of their hoſtility to him. The reformer, by means of his own petitions, and the interference of thoſe friendly to his cauſe, was allowed to be heard at Augſburg, inſtead of being obliged to travel to Rome. Even here, his avowed enemy, cardinal Cajetan, was appointed to try the merits of the queſtion. Luther arrived at Augſburg in the month of October, 1518, and was immediately admitted into the preſence of the cardinal, who, in their ſeveral interviews, would not condeſcend to argue the matter with a perſon of ſuch inferior rank: but, by the mere dictate of authority, required Luther, by virtue of the apoſtolic powers with which he was inveſted, to retract the opinions which he had advanced, and to ſubmit, without heſitation, to the judgment of the pope. Luther, though, for the moment, ſurpriſed at the demand of recantation, declared that he could not, with a ſafe conſcience, renounce opinions which he believed to be true, nor ſhould any conſideration induce him to do what would be ſo baſe in itſelf and ſo offenſive to God: ſtill, however, he declared his readineſs to ſubmit to the lawful determination of the church. He went much farther: he expreſſed a willingneſs to refer the controverſy to certain univerſities which he named, and promiſed neither to write nor preach concerning indulgences, provided the ſame ſilence with reſpect to them were enjoined on his adverſaries. Theſe offers were rejected by the cardinal, who peremptorily inſiſted upon a ſimple recantation, and, at the ſame time, forbad the reformer to enter again into his preſence, unleſs he came prepared to comply with what he required. As he had no intention to ſubmit, he thought it more prudent to withdraw, which he did in as private a manner as poſſible, having firſt prepared a formal and ſolemn appeal from the pope, who was then ignorant of his cauſe, to the pope, at a time when he ſhould have received more full and explicit information with reſpect to it.

The ſudden departure of Luther enraged the papal legate, who wrote to the elector of Saxony, requiring him to withdraw his protection from ſo ſeditious a perſon, and either to ſend him priſoner to Rome, or to baniſh him from his territories. The elector refuſed to comply with either of theſe requeſts, though with many external profeſſions of eſteem for the cardinal; but he at the ſame time aſſured Luther privately, that he would not deſert him. Being thus ably ſupported, Luther continued to vindicate his opinions, and he gave a challenge to all the inquiſitors to come and diſpute with him at Wittemburg, promiſing them not only a ſafe conduct from the elector, but liberal entertainment, free from all expences, while they continued at that place. In the mean time Leo's ambition urged him to iſſue a bull, by which he attempted, by his papal authority, to put an end to the diſpute about indulgences, and in this public paper, he magnified, almoſt without bounds, the efficacy of indulgences, and imperiouſly commanded all Chriſtians to aſſent to what he delivered, as the doctrine of the Holy Catholic church. Luther was now ſatiſfied that the ſtorm would ſpeedily fall upon him, and therefore had recourſe to the only expedient left him, to ward off the effect of papal cenſures, by appealing from the pontiff to a general council, which he maintained to be ſuperior in authority to the pope. In January 1519 the emperor died, which rendered it expedient for the court of Rome to ſuſpend any direct proceedings againſt Luther; for by this event, the vicariat of that part of Germany, which is governed by Saxon laws, devolved on the elector of Saxony, and was executed by him during the interregnum which preceded the election of the emperor Charles V. Under the adminiſtration of this prince, Luther enjoyed tranquillity, and his opinions were ſuffered to take root, and even to grow up with ſome degree of ſtrength and firmneſs.

Leo now hoped he ſhould be able to bring back Luther to ſubmiſſion and obedience, without having recourſe to harſh meaſures. He accordingly fixed on Charles Miltitz, a Saxon knight, a perſon endowed with much prudence and dexterity, whom he ſent into Saxony, as his legate, to preſent the elector with a golden conſecrated roſe, as a mark of peculiar diſtinction, and alſo to treat with Luther about the means of reconciling him to the court of Rome. Miltitz, by his great addreſs and ſoothing manners, and his encomiums on Luther's character, produced a conſiderable effect on his mind, and he made ſuch conceſſions as proved, that his principles as a reformer were by no means ſteadily fixed. He agreed to obſerve a profound ſilence on the ſubject of indulgences, provided his adverſaries were bound to the ſame meaſures; and he wrote a humble and ſubmiſſive letter to the pope, acknowledging he had carried his zeal and animoſity too far; and he even conſented to publiſh a circular letter, exhorting his followers and adherents to reverence and obey the dictates of the Holy Roman church.

Had the court of Rome been ſufficiently prudent, and accepted this ſubmiſſion of Luther, and prevented its own champions from engaging in the field of controverſy, the cauſe of the reformation would have been loſt. But the inconſiderate zeal of ſome of Luther's opponents, renewed the diviſions which were ſo nearly healed, and obliged Luther and his followers to examine deeper into the enormities which prevailed in the papal hierarchy, as well as the doctrines of the church. During this year a famous controverſy was carried on at Leipſic, on the challenge of Eckius, between himſelf and Carloſtadt, concerning the freedom of the will, and at the ſame time he urged Luther to enter the liſts with him, on the ſubject of the pope's authority and ſupremacy. The challenge was accepted, and on the appointed day the three champions appeared in the field. The aſſembly which met to witneſs the combat was numerous and ſplendid, and each of the combatants conducted himſelf with great ſkill and dexterity; in the courſe of the debate, Luther no doubt was carried farther than he dreamed of going, led on from one argument to another: he at length maintained, that the church of Rome, in the earlier ages, had never been conſidered as ſuperior to other churches, and combated the pretenſions of that church and its biſhop, from the teſtimony of ſcripture, the authority of the fathers, and the moſt approved eccleſiaſtical hiſtorians, and even from the decrees of the council of Nice, while the beſt arguments of his adverſary were derived from ſpurious decretals, none of which could boaſt of an antiquity equal to that of four centuries. Hoffman, the preſident, refuſed to declare on which ſide victory had fallen, and the queſtion was referred to the univerſities of Paris and Erfurt. Eckius clearly ſaw that the auditors generally declared in favour of the arguments made uſe of by his adverſary, and from this moment he breathed fury and revenge againſt Luther. The latter had, however, the happineſs to know, that he had convinced the celebrated Philip Melancthon, at that time profeſſor of the Greek, at the univerſity of Wittemburg, of the juſtice of his cauſe, and he ſoon after found a vigorous auxiliary in Ulric Zuingle, a canon of Zurich, in Switzerland, whoſe extenſive learning and uncommon ſagacity were accompanied with the utmoſt intrepidity and reſolution. The party of reformers now was great in the talents, and illuſtrious in the characters of their leaders, who made, at this period, the utmoſt efforts to draw over Eraſmus to their ſide. The reputation and authority of this great ſcholar were of the higheſt weight in Europe, as well on account of his talents as of his ſtrictures upon the errors of the church, and upon the ignorance and vices of the clergy. He had ſown the ſeeds which Luther cheriſhed and brought to maturity, but was, however, too wary to entangle himſelf ſo deeply in the diſpute as to lead him into any danger. About this time the univerſities of Cologne and Louvain took part againſt Luther, againſt whoſe decrees he immediately wrote with his uſual ſpirit and intrepidity. Eckius likewiſe repaired to Rome, intent on accompliſhing the ruin of Luther, and he thought he had performed the deed when, by his exertions and influence, pope Leo aſſembled the college of cardinals to prepare a ſentence againſt him with ſuch deliberation, as it was hoped no exception could be taken, either with regard to form or matter.

On the 15th of June 1520, the bull was iſſued, in which forty-one propoſitions, extracted from Luther's works, were condemned as heretical and ſcandalous, and all perſons were forbidden to read his writings on pain of excommunication; thoſe who poſſeſſed any of them were commanded, under ſevere penalties, to commit them to the flames. Luther himſelf, if he did not within ſixty days publicly recant his errors, and burn his books, was pronounced an obſtinate heretic, excommunicated, and delivered unto Satan for the deſtruction of the fleſh; and all ſecular princes were required, under pain of incurring the ſame cenſure, to ſeize his perſon, that he might be puniſhed as his crimes ſhould be found to merit. Short-ſighted prieſts, and raſh bigots, contemplated in this ſentence the ruin of Luther, and the termination of thoſe principles which he had eſpouſed; but it has proved fatal only to the church which uttered it, and to the cauſe which it was intended to ſupport. When an account of what had happened was brought to Luther, he was neither diſconcerted nor intimidated, but calmly conſulted the moſt proper means of preſent defence, and future ſecurity. He appealed a ſecond time to a general council, and came to the reſolution of voluntarily renouncing communion with the church of Rome, and in juſtification of his own conduct, which he might well expect would be every where, though not by all perſons, condemned, he expoſed to the world, without the leaſt diſguiſe or ceremony, the abominable corruptions and deluſions of the papal hierarchy; he went ſtill farther, and without heſitation declared, in the moſt ſolemn manner, before the whole world, that the pope was the predicted "man of ſin," the anti-chriſt ſet forth in the writings of the New Teſtament. Being now releaſed from all obedience to the pope, and ſetting himſelf up in oppoſition to his power, he declaimed, without ſcruple, againſt his tyranny, and he exhorted all Chriſtian princes to ſhake off the ignominious yoke, which had been ſo long impoſed on them, but the weight of which neither they nor their fathers could well bear. He made it the theme of his joy and exultation, that he was marked out as an object of eccleſiaſtical indignation, becauſe he had ventured to aſſert and vindicate the liberty of mankind. Luther proceeded from words to acts; Leo had burnt the books of Luther, and he, by way of returning the compliment, aſſembled all the profeſſors and ſtudents of the univerſity of Wittemburg, and with much ceremony, in the preſence of a prodigious multitude of people of all ranks and orders, committed to the flames the pope's bull, and the decretals and canons relating to his ſupreme juriſdiction: the example was ſoon followed in ſeveral cities of Germany. He next collected from the canon law ſome of the moſt extravagant propoſitions with reſpect to the omnipotence of the papal power, and the ſubordination of all ſecular juriſdiction to the authority of the holy ſee, which he publiſhed with a commentary, pointing out the impiety of ſuch tenets, and their evident tendency to ſubvert all civil government. Within a month after this, a ſecond bull was iſſued againſt him, by which he was expelled from communion with the church, for having inſulted the majeſty, and diſowned the ſupremacy of the Roman pontiff. The intimidating power of papal condemnation had now loſt its effect in Germany, and the bull of Leo put his antagoniſt upon the project of founding a church upon principles directly oppoſite to thoſe of Rome, and to eſtabliſh in it a ſyſtem of doctrine and eccleſiaſtical diſcipline, more conſonant with the ſpirit and precepts of the goſpel.

From this time Luther never ceaſed to attack the corruptions of the church of Rome, and his reaſoning made deep impreſſions upon the minds of the people; their reſpect and reverence for ancient inſtitutions and doctrines in which they had been educated were ſhaken. Students crowded from all parts of the empire to Wittemburg, and under Luther, Melancthon, Carloſtadt, and other eminent, and, for the time, truly enlightened profeſſors, imbibed principles, which, on their return, they propagated among their countrymen with zeal and ardour. On the arrival of Charles V. in Germany, the firſt act of his adminiſtration was to aſſemble a diet of the empire at Worms. This meeting was fixed for the ſixth of January 1521; in the circular letter to the different princes, the emperor informed them that the expreſs purpoſe of this meeting, was to concert with them the proper meaſures for checking the progreſs of thoſe new and dangerous opinions, which threatened to diſturb the peace of Germany, and overthrow the religion of their anceſtors. At the ſame time the pope gave notice to the elector of Saxony, of the decree which he had iſſued againſt the hereſies of Luther, and requeſted that he would ſo far concur with him as to cauſe all the writings of Luther to be publicly burnt, and that he would either put the author of them to death, or impriſon him, or at leaſt ſend him to Rome. He ſent a ſimilar meſſage to Wittemburg, but neither the elector nor the univerſity paid any attention to the exhortations of his holineſs. To the elector of Saxony Luther was under infinite obligations, as by him alone was the emperor prevented from taking ſteps, which would have been fatal to the progreſs of his cauſe. As ſoon as the diet was aſſembled at Worms, the papal legates inſiſted that they were bound, without deliberation, to condemn a man whom the pope had already excommunicated as an obſtinate heretic. The emperor in this was ready to acquieſce, but the elector again ſtepped forth in defence of Luther, and not only prevented the publication of any unjuſt edict againſt him, but inſiſted that he ought to have his cauſe tried by the canons of the Germanic church, and the laws of the empire. It was therefore reſolved, that Luther ſhould be ſummoned before the diet, and be allowed a hearing before any final ſentence ſhould be pronounced againſt him. To protect him againſt the violence of his enemies, the emperor, and all the princes through whoſe territories he was to paſs, granted him a ſafe conduct, and Charles himſelf wrote to require his immediate attendance, renewing, in the moſt ſolemn manner, his aſſurances of protection from injury or ill-treatment. Luther had no ſooner received the ſummons than he prepared to obey it. Nor could the remonſtrances of his friends prevent him from running the riſk of being treated as his books had been already treated. Some of them, anxious for his ſafety, reminded him of the fate of the celebrated Huſs under ſimilar circumſtances, and protected by the ſame ſecurity of an imperial ſafe-conduct, and filled with ſolicitude, adviſed and entreated him not to ruſh wantonly into danger. But Luther with calmneſs and dignity replied, "I am lawfully called to appear at Worms, and thither will I go in the name of the moſt high God, though as many devils, as there are tiles on the houſes, were there combined againſt me."

On the 16th of April Luther arrived at Worms, where greater crowds are ſaid to have aſſembled to behold him, than had ever appeared at the emperor's public entry. While he continued in that city, he was not only treated with reſpect, but his apartments were reſorted to by perſons of high rank, and by the princes of the empire. Before the diet he behaved with becoming reſpect; he acknowledged that he had ſometimes been carried away by the ardour of his temper, and that the vehemence of his writings could not always be juſtified. While, however, he readily admitted his errors, he ſhewed no inclination to renounce a ſingle important principle which he had been promulgating, and he diſplayed the utmoſt preſence of mind when he was called on to plead his cauſe before the grand aſſembly, on the 17th and 18th of April. That his reaſonings ſhould not change the minds of thoſe who came to condemn, cannot be a matter of ſurprize, but when he was called on to recant, he ſolemnly declared, that he would neither abandon his principles, nor materially change his conduct, unleſs he were previouſly convinced, by the ſcriptures, or the force of reaſoning, that his ſentiments were erroneous and his conduct unlawful. Enraged at his unbending ſpirit, ſome of the eccleſiaſtics propoſed, notwithſtanding the promiſes made to the contrary, to avail themſelves of the opportunity of having an enemy in their power, to deliver the church at once from ſuch a peſtilent heretic. But the members of the diet and the emperor alſo refuſed to act in a manner that muſt blaſt their character for ever with the world, and Luther was permitted to depart in ſafety. Scarcely, however, had he left the city, when, in the emperor's name, and by the authority of the diet, he was, in a moſt ſevere edict, pronounced an obſtinate heretic, a member cut off from the church, deprived of the privileges which he had enjoyed as a ſubject of the empire, and the ſevereſt puniſhments were denounced againſt thoſe who ſhould receive, entertain, or countenance him, either by acts of hoſpitality, by converſation, or writing, and all were required to concur in ſeizing his perſon, as ſoon as the term of his ſafe-conduct expired. This decree produced ſcarcely any effect; the emperor was too much engaged by the commotions in Spain, and in the wars in Italy and the Low Countries, to attend to Luther, and the ſovereign princes who had not been preſent at the diet, and who felt for the liberties of the empire, and the rights of the Germanic church, treated it with the higheſt indignation, or the utmoſt contempt. Luther was ſtill, to the elector of Saxony, the object of his moſt anxious ſolicitude; and the meaſures which he adopted at this critical juncture, effectually ſecured him from the threatening ſtorm. In conſequence of a preconcerted plan, and, as ſome hiſtorians have imagined, not without the knowledge of the emperor, as Luther was on his journey, near Eiſenach, a number of horſemen in maſks ruſhed out of a wood, and ſurrounding his company, carried him off with the utmoſt ſpeed to the caſtle of Wartenburg. There the noble-minded elector ordered him to be ſupplied with every thing that he could want, but the place of his retreat was kept a profound ſecret. The ſudden diſappearance of Luther not only occaſioned the moſt bitter diſappointment to his adverſaries, but rendered them doubly odious to the people of Germany, who, not knowing what was become of their leader in reformation, conjectured a thouſand things, till at length they were ready to give him up as deſtroyed by the fury of his enemies. Luther was, however, living in peace, and in the enjoyment of whatever was neceſſary to his well being and to his amuſement; he was frequently indulged with the exerciſe of hunting in the company of thoſe who had the charge of him, living in this retirement under the name of Yonker George. During the period of his ſolitude, he tranſlated a great part of the New Teſtament into the German language, wrote and publiſhed tracts in defence of his doctrines, which, as ſoon as they were ſeen, revived and animated the ſpirit of his followers, and wrote frequent letters to his friends; he had alſo, during this period, the ſatisfaction of knowing that his opinions were gaining ground, and that they had already made ſome progreſs in almoſt every city in Saxony. Luther, weary at length of his retirement, appeared publicly at Wittemburg, in March 1522: this ſtep he took without the elector's knowledge or conſent, but he immediately wrote him a letter to prevent the poſſibility of his taking offence, aſſigning as a reaſon, that it was in conſequence of the information which he had received of the proceedings of Carloſtadt, one of his diſciples, who was animated with ſimilar zeal, but poſſeſſed leſs prudence and moderation than his maſter. This perſon, in the abſence of Luther, had attempted to aboliſh the uſe of maſs, to remove images out of the churches, to ſet aſide auricular confeſſion, the invocation of ſaints, and in ſhort had quite changed the doctrine and diſcipline of the church at Wittemburg, all which Luther ſaid was unſeaſonably and raſhly done. At this time the doctrines of the reformer were not known in France; and in England, the ſovereign, Henry VIII., had made the moſt vigorous exertions to prevent them from invading his realms: he even undertook to write them down, in a treatiſe entitled “Of the Seven Sacraments,” &c. This work he preſented to Leo X. in October 1521. The pope was ſo well pleaſed with the royal attempt to confute the arguments of Luther, that he complimented him with the title of “Defender of the Faith.” Whatever reſpect and reverence Luther might ſhew to kings as ſuch, he had none for the arguments of an antagoniſt, though armed with royal authority, and anſwered Henry with much ſeverity, treating his performance in the moſt contemptuous manner. Luther now publiſhed his tranſlation of the ſcriptures, which produced ſudden, and almoſt incredible effects on the people of Germany, and proved more fatal to the church of Rome than all his other works. It was read with the utmoſt avidity by perſons of every rank, who, with aſtoniſhment, diſcovered, how contrary the precepts of Chriſt are to the inventions of his pretended vicegerents, and being in poſſeſſion of the rule and ſtandard of faith, they conceived themſelves qualified to judge of eſtabliſhed opinions, and to pronounce when they were conformable to that ſtandard. About this time, ſeveral imperial cities in Germany aboliſhed the maſs, and the other ſuperſtitious rites of popery, and openly embraced the reformed religion. The elector of Brandenburg, the dukes of Brunſwick and Lunenburg, and the prince of Anhalt, became avowed patrons of Luther's opinions, and countenanced the preaching of them in their territories. Luther now made open war with the pope and biſhops, and to render them as deſpicable as poſſible, he wrote one book againſt the pope's bull, and another againſt the order falſely called the order of the biſhops. The ſame year he wrote to the aſſembly of the ſtates of Bohemia, in which he aſſured them that he was labouring to eſtabliſh their doctrine in Germany, and exhorted them not to return to the communion of the church of Rome. Ferdinand, archduke of Auſtria, the emperor's brother, promulgated a very ſevere edict againſt the tranſlation of the ſcriptures, and forbade all the ſubjects of his imperial majeſty to poſſeſs any copies of it, or of Luther's other works. In this ſtate of things Leo X. died, and was ſucceeded on the papal throne by Adrian VI., who immediately concerted meaſures with his cardinals concerning the beſt means for ſtopping the progreſs of hereſy. The diet of the empire was holden ſoon after at Nuremberg, to which Adrian ſent his brief, in which he obſerves, that he had heard with grief and indignation, that Martin Luther continued to teach the ſame errors, and to publiſh almoſt daily books full of hereſies; that it appeared ſtrange to him that ſo large and ſo religious a nation could be ſeduced by a wretched apoſtate friar; that nothing, however, could be more pernicious to Chriſtendom, and that he therefore accordingly exhorts them to uſe their utmoſt endeavours to make Luther, and the authors of theſe tumults, return to their duty; or, if they refuſe and continue obſtinate, to proceed againſt them according to the laws of the empire.

The admonitions of his holineſs produced no effect whatever, and the diſciples of Luther advanced in their career with exultation and triumph. In 1523, Luther publiſhed ſeveral pieces; among theſe were ſome on the monaſtic life, which he attacked with great ſeverity, and his exhortations, united with much ſtrong ſatire, produced important effects, for ſoon after nine nuns, among whom was Catharine de Bore, whom he afterwards married, eloped from a nunnery and came to Wittemburg, an act that was as highly applauded by the reformer, as it was condemned by the devotees to the Roman church. Luther compares the deliverance of theſe nuns from the ſlavery of monaſtic life to that of the ſouls which Chriſt had delivered by his death. This year two of the followers of Luther were burnt at Bruſſels, and theſe were the firſt who ſuffered martyrdom for his cauſe: and about the ſame time that this tragical event was perpetrated, he wrote a conſolatory letter to three noble ladies at Miſnia, who were baniſhed from the duke of Saxony's court at Friburg, for reading his books.

On the death of Adrian VI., Clement VII. who ſucceeded him, ſent a legate to the diet which was to be held at Nuremberg, to urge the neceſſity of a ſpeedy execution of the edict of Worms: he was unſucceſsful in the object of his miſſion, and found that the German princes, in general, were not at all inimical to the reformation; he accordingly retired to Ratiſbon with the biſhops, and thoſe of the princes who adhered to the cauſe of Rome, where they engaged vigorouſly to execute the edict of Worms in their reſpective dominions. It was in the courſe of this year that the controverſy between Eraſmus and Luther on the doctrine of “free-will” commenced. Eraſmus had been long urged to take up his pen againſt the reformer, though it was with the greateſt reluctance that he yielded to the importunities of the pope and Catholic princes, ſuſpecting that it would not be found the beſt mode of ending the differences, and eſtabliſhing the peace of the church. At length he ſtood forward in defence of the doctrine of free-will, being deſirous to clear himſelf from the ſuſpicion of favouring a cauſe, which he would not wiſh to be thought in any way to favour. His book was entitled a “Conference concerning Free-will,” which was written with much moderation, and without perſonal reflections. To ſoften the anger of Luther, he ſays in his preface, "That he ought not to take it ill that he diſſents from his opinions in particular points, as he had allowed himſelf the liberty of differing from the judgment of popes, univerſities, and doctors in the church." It was ſome time before Luther took up his pen in defence of his own poſitions, but his anſwer was extremely ſevere: he accuſed his opponent of "being careleſs about religion, and little ſolicitous what became of it, provided the world continued in peace, and that his notions were rather philoſophical than dictated by Chriſtian truth." Luther was next engaged in a controverſy with Carloſtadt, reſpecting the euchariſt. Though Luther had renounced the doctrine of "tranſubſtantiation," according to which the bread and wine were changed by conſecration into the body and blood of Chriſt, yet he thought that the partakers of the Lord's ſupper received in ſome myſtical way, with bread and wine, the real body and blood of Chriſt. This doctrine obtained the name of "conſubſtantiation." Carloſtadt, who, as we have ſeen, was the diſciple of Luther, maintained that the body of Chriſt was not actually preſent, but that the bread and wine were no more than external ſigns, or ſymbols, deſigned to excite in the minds of Chriſtians the remembrance of the ſufferings and death of Chriſt, and of the benefits which ariſe from them. This opinion was univerſally embraced by all the friends of the reformation in Switzerland, and by a conſiderable number of its votaries in Germany, but it was the commencement of a controverſy that was carried on with much bitterneſs, which, notwithſtanding the endeavours that were uſed to reconcile the contending parties, terminated at length in a fatal diviſion between thoſe who had embarked together in the ſacred cauſe of religion and liberty, and which contributed to retard the progreſs of the reformation.

In the month of October 1524, Luther threw off the monaſtic habit, which, though not premeditated and deſigned, was regarded as a very proper introduction to a ſtep which he took the following year, *viz.* his marriage to Catharine, the perſon already referred to, who had eloped from the nunnery of Nimptchen. This meaſure expoſed him to much obloquy from his own friends, as well as from the Catholics. He was even aſhamed of it himſelf, and acknowledged that it had made him ſo deſpicable, that he hoped his humiliation would give joy to angels, and be the ſource of vexation to devils. Melancthon found him ſo much afflicted with his paſt conduct, that he wrote ſome letters of conſolation to him. It was not, it was ſaid, ſo much the marriage, as the circumſtances of the time, and the precipitation with which it was done, that occaſioned the cenſures paſſed upon Luther. He married ſuddenly, and at a time when Germany was groaning under the miſeries of a war which had been occaſioned by the introduction of the new doctrines, and which will be noticed under the article REFORMATION. Luther ſoon recovered from the ſtate of abaſement into which he had for a ſeaſon fallen, and then aſſumed his former air of intrepidity, and boldly ſupported what he had done. "I took," ſaid he, "a wife, in obedience to my father's commands, and haſtened the conſummation, to prevent impediments, and ſtop the tongues of ſlanderers."

About this period Luther loſt by death his friend, and the faſt friend of the reformation, Frederic, elector of Saxony; but the blow was leſs ſenſibly felt, as he was ſucceeded by his brother John, a more avowed and zealous, but leſs able, patron of Luther and his doctrines. Frederic had been a kind of mediator between the Roman pontiff and the reformers of Wittemburg, and had always entertained the hope of reſtoring peace in the church, and of ſo reconciling the contending parties, as to prevent a ſeparation either in point of eccleſiaſtical juriſdiction or religious communion: hence, though rather favourable to the innovations of Luther, he took no pains to introduce any change into the churches of his own dominions, nor to ſubject them to his juriſdiction. But his ſucceſſor acted very differently: he ordered a body of laws relating to the form of eccleſiaſtical government, the method of public worſhip, the rank, offices, and revenues of the prieſthood, and other matters of that nature, to be drawn up by Luther and Melancthon, which he afterwards promulgated throughout his dominions. The example of this prince was followed by all the other princes and ſtates of Germany, who renounced the papal ſupremacy and juriſdiction. The Lutherans were now threatened with a grievous perſecution, which the public troubles of Europe only prevented from being carried into execution: they, on the other hand, were not negligent in taking effectual meaſures for defending themſelves againſt the ſuperſtition and violence of their adverſaries, and formed the plan of a confederacy for that prudent purpoſe.

In June 1526, a diet of the empire was held at Spires, at which Ferdinand, the emperor's brother, preſided; Charles being fully occupied with the troubles in Spain and Italy. When the ſtate of religion came before the aſſembly, the emperor's ambaſſadors uſed their utmoſt endeavours to obtain a reſolution, that all diſputes about religion ſhould be ſuppreſſed, and that the ſentence which had been pronounced at Worms againſt Luther and his followers ſhould be put into rigorous execution; but it was agreed, that they could not execute that ſentence, nor come to any determination with reſpect to the doctrines by which it had been occaſioned, before the whole matter was ſubmitted to the cognizance of a general council, lawfully aſſembled. An addreſs to the emperor was unanimouſly agreed on, beſeeching him to aſſemble, without delay, a free and general council; and it was alſo reſolved, that, in the mean time, the princes and ſtates of the empire ſhould, in their reſpective dominions, be at liberty to manage eccleſiaſtical matters in the manner which they ſhould think expedient; yet ſo as to be able to give an account of their adminiſtration to God and the emperor. This was a reſolution the moſt favourable to the cauſe of Lutheraniſm; and ſeveral potentates, whom the dread of perſecution had hitherto prevented from declaring for the reformation, being now delivered from their reſtraint, renounced publicly the ſuperſtition of Rome, and introduced among them the ſame form of religious worſhip, and the ſame ſyſtem of doctrine, which had been received in Saxony. Luther and his fellow-labourers, in the mean time, by their writings, their inſtructions, their admonitions, and counſels, were carrying on their great cauſe with a ſpirit ſuitable to the importance and greatneſs of their undertaking. But this encouraging ſtate of affairs was not of long duration: the emperor began to take meaſures for the recovery of thoſe prerogatives which had been ſnatched from his predeceſſors, and which were neceſſary to the promotion of his ambitious ſchemes. For this purpoſe, he regarded it as neceſſary to ſuppreſs opinions, which might form new bonds of confederacy among the princes of the empire, and unite them by ties ſtronger and more ſacred than any political connection. He accordingly reſolved to employ all the means in his power for the full eſtabliſhment of the religion, of which he was regarded the natural protector; conſidering this as the inſtrument by which he could extend his civil authority. He appointed, for this purpoſe, a diet of the empire to be held at Spires, in the ſpring of 1529, for the expreſs purpoſe of taking into conſideration the ſtate of religion. In that diet the archduke Ferdinand preſided, and had the addreſs to procure a majority approving a decree, which declared it unlawful to introduce any change in the doctrine, diſcipline, or worſhip of the eſtabliſhed religion, before the determinations of a general council were known. This decree was exceedingly revolting to the elector of Saxony, and other princes, as well as to the deputies of fourteen imperial cities, who, in a body, when they found their arguments and remonſtrances of no avail, entered their ſolemn *proteſt* againſt it, on the 19th of April 1529, and appealed to the emperor and a future council. On this account they were diſtinguiſhed by the name of PROTESTANTS, which, from this period, has been applied to all ſects of whatever denomination which have ſeparated themſelves from the Roman church. The proteſting princes ſent embaſſies to the emperor, which were ill received; and in anſwer to one of them, they received an account that he was determined to come into Germany, with a view to terminate, in a diet to be held at Augſburg, in June 1530, the religious diſputes which had produced ſo many and grievous diviſions in the empire. Charles had many conſultations with pope Clement VII. concerning the moſt effectual means for that purpoſe. In theſe interviews the emperor inſiſted, in the moſt urgent manner, on the neceſſity of aſſembling a general council: to this his holineſs was a decided enemy, becauſe he had learnt from hiſtory that general councils were factious, ungovernable, and ſlow in their operations; and he contended that the ſureſt way was for the emperor to do his duty, in ſupporting the authority of the church, and in employing all his power in executing ſpeedy vengeance on the obſtinate heretical factions, who dared to call in queſtion the authority of the holy Roman ſee. Charles was ſtill for mild and conciliatory meaſures, but promiſed if theſe ſhould prove ineffectual, that then he would employ the weight of his authority in reducing the rebellious to implicit obedience. In his journey to Augſburg he had full opportunity of knowing the ſentiments of the people, and, from his own obſervation, he was ſatisfied that ſeverity ought not to be attempted, until other meaſures proved ineffectual: he therefore called on the elector of Saxony to obtain from Luther, and other eminent divines, a written explication of their religious ſyſtem, and an explicit avowal of the ſeveral points in which they differed from the church of Rome. Luther delivered to the elector at Torgaw ſeventeen articles, called "The articles of Torgaw," which were deemed by him a proper declaration of the ſentiments of the reformed. By others they were not thought ſufficiently open, and Melancthon was deſired to give an account of the ſame, who, with a due reſpect to the ſentiments of Luther, expreſſed his opinions, and ſet forth his doctrine, with the greateſt elegance and perſpicuity, and in terms as little offenſive as poſſible to their opponents. Such was the origin of the creed, celebrated in hiſtory as "The confeſſion of Augſburg." In June 1530, the diet was opened; and in a few days, the Proteſtants, who had adopted the opinions of Zuingle, delivered their confeſſion, drawn up by Martin Bucer. A refutation of this was undertaken by Faber, Eckius, and Cochlæus, which was read publicly in the diet; and the unlimited ſubmiſſion of the Proteſtants to the doctrines contained in it was required by the emperor. Inſtead, however, of yielding obedience to the imperial command, they demanded a copy of the paper, in order that they might have an opportunity of demonſtrating more fully its extreme inſufficiency and weakneſs. This requeſt was refuſed, and there was now no proſpect of a reconciliation. The emperor next attempted to bring over to his views the princes who had been ſome time the patrons of the new doctrines: but however deſirous they might be of obliging the emperor, they would not make ſacrifices to him of their integrity, and, in a firm tone, refuſed to abandon what they deemed the cauſe of God, for the ſake of any earthly acquiſition. The emperor, diſappointed and exceedingly vexed, reſolved to take vigorous meaſures for aſſerting the authority and doctrines of the eſtabliſhed church, and enforcing the ſubmiſſion of heretics. He accordingly condemned the peculiar tenets held by the Proteſtants, forbidding any perſon to protect or even tolerate ſuch as taught them, enjoining a ſtrict obſervance of the eſtabliſhed rites, and prohibiting any further innovation under ſevere penalties. This decree, which was regarded as a prelude to the moſt violent perſecution, convinced the Proteſtants that the emperor was reſolved on their deſtruction; and the dread of the calamities which were ready to fall on the church oppreſſed the ſpirit of Melancthon, who reſigned himſelf to a ſettled melancholy. Luther, however, was not at all diſheartened, and uſed his utmoſt efforts to keep up the ſpirits of thoſe who were willing to give way; being aſſured that their perſonal ſafety, as well as ſucceſs, depended wholly on union. In purſuance of this opinion, they aſſembled in 1530, firſt at Smalcalde, and afterwards at Frankfort, where they formed a ſolemn alliance and confederacy, with the reſolution of defending vigorouſly their religion and liberties againſt the dangers with which they were threatened by the edict of Augſburg. They invited the kings of England, France, and Denmark, to join in the confederacy; and, by their negociations, ſecured powerful protection and aſſiſtance, in caſe of neceſſity. Luther was at firſt averſe from this confederacy, dreading the calamities which it might produce. In this ſtate of things, the elector palatine and the elector of Mentz offered their mediation, and endeavoured to reconcile the contending princes; and, in a ſhort time, negociations were carried on, that finally produced a pacification, the terms of which were agreed upon at Nuremburg, and ſolemnly ratified in the diet at Ratiſbon, Auguſt 3d, 1532. By this treaty, the Proteſtant princes engaged to aſſiſt the emperor with all their forces, in reſiſting the invaſion of the Turks; and it was ſtipulated that univerſal peace ſhould be eſtabliſhed in Germany, until the meeting of a general council, the convocation of which the emperor was to endeavour to procure within ſix months; that no perſon ſhould be moleſted on account of religion; that a ſtop ſhould be put to all proceſſes begun by the imperial chamber againſt the Proteſtants; and that the ſentences already paſſed to their detriment ſhould be declared void.

Luther now had the ſatisfaction and happineſs of ſeeing one of the chief obſtacles to the undiſguiſed profeſſion of his opinions removed; and henceforth he might ſit down and contemplate the mighty work which he had accompliſhed: his diſciples and followers, the Proteſtants of Germany, who had hitherto been regarded only as a religious ſect, came to be conſidered as a political body of ſome conſequence. The emperor, in conformity to the ſtipulations of the truce lately concluded, applied to the pope for a general council: but Clement threw a multitude of obſtacles in the way to prevent it; and when he found that to be impoſſible, he inſiſted that the meeting ſhould be held in Italy, but the Proteſtants contended for it in Germany. The latter inſiſted that all matters in diſpute ſhould be determined by the words of Scripture alone; the pope aſſerted that the decrees of the church and the opinions of the fathers were of equal authority. They required a free council, in which the divines, commiſſioned by different churches, ſhould be allowed a voice; he aimed at modelling the council in ſuch a manner as would render it entirely dependent on his pleaſure.

Above all, the Proteſtants thought it unreaſonable that they ſhould bind themſelves to ſubmit to the decrees of a council, before they knew on what principles thoſe decrees were founded, by what perſons they were to be pronounced, and what forms of proceeding they would obſerve. The pope maintained it would be unneceſſary to call a council, unleſs thoſe who demanded it previouſly declared their reſolution to acquieſce in its decrees. The meeting was accordingly poſtponed during the pontificate of Clement VII.

In 1533 Luther wrote a conſolatory epiſtle to ſome perſons who had ſuffered hardſhips for adhering to the Augſburg confeſſion of faith, in which he ſays, “ The devil is the hoſt, and the world is his inn ; ſo that wherever you come, you will be ſure to find this ugly hoſt.” He had alſo, about this time, a terrible controverſy with George, duke of Saxony, who had ſuch an averſion to the doctrines promulgated by Luther, that he obliged his ſubjects to take an oath that they would never embrace them. At Leipſic there were found ſixty or ſeventy perſons, who could not be reſtrained within the boundaries of the eſtabliſhed creed, and it was diſcovered that they had conſulted Luther about it ; upon which the duke complained to the elector, that Luther had not only abuſed his perſon, but had preached up rebellion among his ſubjects. Luther refuted the accuſation, by proving that he had been ſo far from ſtirring up his ſubjects againſt him, on the ſcore of religion, that he had exhorted them rather to undergo the greateſt hardſhips, and even ſuffer themſelves to be baniſhed. In the following year, the bible, tranſlated by Luther into the German, was firſt printed, with the privilege of the elector ; and it was publiſhed the year after. He likewiſe gave to the world a book againſt maſſes, and the conſecration of prieſts, in which he relates a conference which he had with the devil upon thoſe points : for it is a circumſtance worthy of obſervation, that, in the whole hiſtory of this great man, he never had any conflicts of any kind, but the devil was always his antagoniſt. In 1535 the new pope Paul III. was applied to for a general council ; and in the hope of preventing it, he appointed Mantua as the proper place. To this ſome of the Catholic ſovereigns, and all the German Proteſtants, ſtrongly objected ; being fully perſuaded that, in ſuch a council, nothing would be concluded but what would be agreeable to the ſentiments and ambition of the pontiff ; and they demanded the performance of the emperor's promiſe, that they ſhould have a council in Germany. At the ſame time, that they might not be taken by ſurpriſe, they deſired Luther to draw up a ſummary of their doctrine, in order to preſent it to the aſſembled biſhops, if it ſhould be required of them. This ſummary, which was diſtinguiſhed by the name of “ The articles of Smalcalde,” from the place at which they were aſſembled, is generally joined with the creeds and confeſſions of the Lutheran church. While our reformer was buſily engaged in this work, he was ſeized with a grievous and very painful diſeaſe, a fit of the ſtone and obſtruction of the urine, which continued ſo long as to give his friends ſerious apprehenſions for his life. In the midſt of his agonies, and after eleven days' torture, without the ſmalleſt relief, he ſet out, contrary to the advice of his friends, on his return home. The motion of the carriage, which it was expected would prove fatal to him, was the cauſe of removing the evil under which he was labouring. In the year 1538, as a general aſſembly ſeemed impracticable, the pope, that he might not ſeem to neglect that degree of reformation which was unqueſtionably within his power, deputed a certain number of cardinals and biſhops, with full authority, to inquire into the abuſes and corruptions of the Roman court, and to propoſe the moſt effectual method of removing them. It was intended to do as little as poſſible : ſtill a multitude of enormities were unveiled, an account of which was ſoon tranſmitted into Germany, much to the ſatisfaction of the Proteſtants there. This inveſtigation, partial as it was, proved the neceſſity of a reformation in the head as well as the members of the church ; and it even pointed out many of the corruptions, againſt which Luther had remonſtrated with the greateſt vehemence. It was, however, intended only as a farce, and as ſuch Luther treated it ; and to ridicule it more ſtrongly, he cauſed a caricature to be drawn, in which was repreſented the pope ſeated on a high throne, ſome cardinals about him with foxes' tails, with which they were bruſhing off the duſt on all ſides. Luther publiſhed, about the ſame time, “ A Confutation of the pretended Grant of Conſtantine to Sylveſter, biſhop of Rome ; and alſo ſome Letters of John Huſs, written from his Priſon at Conſtance, to the Bohemians.” On the death of George, duke of Saxony, the ſucceſſion devolved on his brother Henry, who was zealouſly attached to the Proteſtant religion, and who, notwithſtanding a clauſe in his brother's will, by which he bequeathed all his territories to the emperor and the king of the Romans, ſhould Henry make any attempt to introduce innovations, immediately invited Luther and ſome other Proteſtant divines to Leipſic. By their aid and advice he quickly overturned the whole ſyſtem of Popiſh rites and doctrines, and eſtabliſhed the full exerciſe of the reformed religion, with the univerſal applauſe of his ſubjects, who had long wiſhed for this change. By this revolution, the whole of Saxony was brought within the Proteſtant pale.

Luther was inceſſantly employed, till his death, in promoting the cauſe of which he was the great founder. In the year 1546, he, in company with Melancthon, paid a viſit to his own country, which he had not ſeen before for many years, and he returned in ſafety ; but in a ſhort time after, he was called thither by the earls of Mansfeldt, to compoſe ſome differences which had ariſen about their boundaries. Though he had not been accuſtomed to ſuch kind of buſineſs, yet he would not refuſe the ſervice which he might be able to render by his advice and authority. On this occaſion he met with a ſplendid reception, uſed his beſt endeavours to ſettle the matters in diſpute, and ſometimes officiated in the church ; but the ſtate of his health was ſo precarious, that it was feared every great effort would prove fatal to him. His laſt public ſervice was in the church, where he was ſeized with a violent inflammation in the ſtomach. His natural intrepidity did not forſake him ; and his laſt converſation with his friends was concerning the happineſs reſerved for good men in a future life. On the morning of the 12th of February 1546, being awakened from a ſound ſleep by his diſorder, and perceiving his end to be approaching, he commended his ſpirit into the hands of God, and quietly departed this life at the age of ſixty-three. He did not forget his cauſe even in his dying moments, but admoniſhed thoſe about him to pray to God for the propagation of the goſpel ; “ becauſe,” ſaid he, “ the council of Trent, which has ſat once or twice, and the pope, will deviſe ſtrange things againſt it.” Immediately after his deceaſe, the body was put into a leaden coffin, and carried with funeral pomp to the church at Eiſleben, when Dr. Jonas preached a ſermon on the occaſion. The earls of Mansfeldt requeſted that his body might be interred in their territories ; but the elector of Saxony inſiſted upon his being brought back to Wittemburg, which was accordingly done, and he was buried there with greater pomp than had been known to have accompanied the funeral of any private man. Princes, earls, nobles, and ſtudents without number, attended the proceſſion, and Melancthon delivered a funeral diſcourſe. He left ſeveral children by his wife Catharine de Bore. Innumerable were the calumnies invented by his enemies reſpecting his death, his principles, and his conduct, which it is needleſs for us to repeat, as they have been amply refuted by the moſt reſpectable hiſtorians. The zeal and madneſs of the Papiſts againſt their formidable antagoniſt, who had ſhaken to the foundation the pillars of their faith, did not ceaſe with his death. They urged the emperor Charles V., while with his army at Wittemburg, to cauſe the monument erected to his memory to be demoliſhed, and his bones to be dug up and burnt with every indignity; but the mind of Charles was ſuperior to ſuch childiſh and malignant acts, and he inſtantly forbad that any inſult ſhould be offered to his tomb, or his remains, upon pain of death. "I have," ſaid the emperor, "nothing farther to do with Luther: he is henceforth ſubject to another judge, whoſe juriſdiction it is not lawful for me to uſurp. Know, that I make not war with the dead, but with the living, who are ſtill in arms againſt me." We cannot bring this article to a cloſe, without referring to the teſtimonies of the learned and the wiſe reſpecting the character of Luther, who introduced, not into Germany only, but into the world, a new and moſt important era, and whoſe name can never be forgotten while any thing of principle remains that is deſerving of remembrance. It muſt not be overlooked, that the grand and leading doctrine of Lutheraniſm, and that on which the permanent foundation of the reformed religion was laid, is the right of private judgment in matters of religion. To this, as we have ſeen, he was at all times ready to devote his talents, his character, and his life; and ſays the biographer of Leo X., "the great and imperiſhable merit of the reformer conſiſts in his having demonſtrated it by ſuch arguments, as neither the efforts of his adverſaries, nor his own ſubſequent conduct, have been able either to confute or invalidate." In paſſing judgment upon the characters of men, ſays Robertſon, we ought to try them by the principles and maxims of their own age, and not by thoſe of another: for although virtue and vice are at all times the ſame, manners and cuſtoms are continually varying. Some parts of Luther's behaviour, which to us appear moſt culpable, gave no diſguſt to his contemporaries. It was even by ſome of thoſe qualities, which we are now apt to blame, that he was fitted for accompliſhing the great work in which he embarked.

Luther himſelf was ſenſible of defects, which he pathetically acknowledges in an addreſs to the reader of his works: "I intreat you," ſays he, "to read my writings with cool conſideration, and even with much pity. I wiſh you to know that when I began the affair of indulgences, I was a monk, and a moſt mad papiſt. So intoxicated was I, and drenched in papal dogmas, that I would have been moſt ready at all times to murder, or aſſiſt in murdering, any perſon who ſhould utter a ſyllable againſt the pope. I was always earneſt in defending doctrines I profeſſed. I went ſeriouſly to work, as one who had a horrible dread of the day of judgment, and who from his inmoſt ſoul was anxious for ſalvation. You will find, therefore, in my earlier writings, with how much humility, on many occaſions, I gave up conſiderable points to the pope, which I now deteſt as blaſphemous and abominable in the higheſt degree. This error my ſlanderers may call inconſiſtency; but you, my pious readers, will have the kindneſs to make ſome allowance, on account of the times, and my own inexperience. I ſtood abſolutely alone at firſt, and certainly was very unlearned, and very unfit to undertake matters of ſuch vaſt importance. It was by accident, not willingly or by deſign, that I fell into thoſe violent diſputes. God is my witneſs."

"Martin Luther, reſenting an affront put on his order, began to preach againſt abuſes in the ſale of indulgences, and being naturally of a fiery temper, and provoked by oppoſition, he proceeded even to deſcry indulgences themſelves, and was thence carried, by the heat of diſpute, to queſtion the authority of the pope. Still, as he enlarged his reading, in order to ſupport theſe tenets, he diſcovered ſome new abuſe or error in the church of Rome, and finding his opinions greedily hearkened to, he promulgated them by writing, diſcourſe, ſermons, conference, and daily increaſed the number of his diſciples. All Saxony, all Germany, all Europe, were in a little time filled with the voice of this daring innovator; and men, rouſed from that lethargy in which they had ſo long ſlept, began to call in queſtion the moſt ancient and received opinions. The elector of Saxony, favourable to Luther's doctrine, protected him from the violence of the papal juriſdiction: the republic of Zurich even reformed their church according to the new model: many ſovereigns of the empire, and the imperial edict itſelf, ſhewed a favourable diſpoſition towards it: and Luther, a man naturally inflexible, vehement, and opinionative, was become incapable, either from promiſes of advancement or terrors of ſeverity, to relinquiſh a ſect of which he himſelf was the founder, and which brought him a glory ſuperior to all others, the glory of dictating the religious faith and principles of multitudes."

Dr. Campbell, in his lectures on Eccleſiaſtical Hiſtory, has rendered our reformer his teſtimony of reſpect and gratitude; but as this is conveyed in ſentiments and language but little different from the obſervations of Dr. Robertſon, we ſhall extract the account from the latter rather than the former: "As he was raiſed up by Providence to be the author of one of the greateſt and moſt intereſting revolutions in hiſtory, there is not any perſon, perhaps, whoſe character had been drawn with ſuch oppoſite colours. In his own age, one party, ſtruck with horror and inflamed with rage, when they ſaw with what a daring hand he overturned every thing which they held to be ſacred, or valued as beneficial, imputed to him not only all the defects and vices of a man, but the qualities of a dæmon. The other, warmed with admiration and gratitude, which they thought he merited as the reſtorer of light and liberty to the Chriſtian church, aſcribed to him perfections above the condition of humanity, and viewed all his actions with a veneration, bordering on that which ſhould be paid only to thoſe who are guided by the immediate inſpiration of heaven. It is his own conduct, not the undiſtinguiſhing cenſure, or the exaggerated praiſe of his contemporaries, that ought to regulate the opinions of the preſent age concerning him. Zeal for what he regarded as truth, undaunted intrepidity to maintain his own ſyſtem, abilities, both natural and acquired, to defend his principles, and unwearied induſtry in propagating them, are virtues which ſhine conſpicuouſly in every part of his behaviour, that even his enemies muſt allow him to have poſſeſſed them in an eminent degree. To theſe may be added, with equal juſtice, ſuch purity, and even auſterity of manners, as became one who aſſumed the character of a reformer; ſuch ſanctity of life as ſuited the doctrine which he delivered, and ſuch perfect diſintereſtedneſs as affords no ſlight preſumption of his ſincerity. Superior to all ſelfiſh conſiderations, a ſtranger to all the elegancies of life, and deſpiſing its pleaſures, he left the honours and emoluments of the church to his diſciples, remaining ſatisfied himſelf in his original ſtate of profeſſor of the univerſity, and paſtor of the town of Wittemburg, with the moderate appointments annexed to each. His extraordinary qualities were allayed with no inconſiderable mixture of human frailty, and human paſſions. Theſe, however, were of a nature, that they cannot be imputed to malevolence or corruption of heart, but ſeem to have taken their riſe from the ſame ſource with many of his virtues. Accuſtomed himſelf to conſider every thing as ſubordinate to truth, he expected the ſame deference for it from other men; and, without making any allowances for their timidity or prejudices, he poured forth againſt ſuch as diſappointed him in this particular, a torrent of invective and abuſe. Regardleſs of any diſtinction of rank or character when his doctrines were attacked, he chaſtiſed all his adverſaries indiſcriminately, with the ſame rough hand; neither the royal dignity of Henry VIII. nor the eminent learning and abilities of Eraſmus, ſcreened them from the ſame groſs abuſe with which he treated Tetzel or Eckius. To rouſe mankind, when ſunk in ignorance and ſuperſtition, and to encounter the rage of bigotry armed with power, required the utmoſt vehemence of zeal, as well as a temper daring to exceſs. A gentle call would neither have reached, nor have excited thoſe to whom it muſt have been addreſſed. A ſpirit more amiable but leſs vigorous than Luther's would have ſhrunk back from dangers which he braved and ſurmounted. Towards the cloſe of Luther's life, though without any perceptible diminution of his zeal and abilities, the infirmities of his temper increaſed upon him, ſo that he grew daily more peeviſh, more iraſcible, and more impatient of contradiction. Having lived to be a witneſs of his own amazing ſucceſs; to ſee a great part of Europe embrace his doctrines, and to ſhake the foundation of papal Rome, before which the mightieſt monarchs had trembled, he diſcovered, on ſome occaſions, ſymptoms of vanity and ſelf-applauſe. He muſt have been, indeed, more than man, if, upon contemplating all that he actually accompliſhed, he had never felt any ſentiment of this kind riſing in his breaſt." There is yet another teſtimony to the life and labours of this great man that we cannot omit:

"Martin Luther's life," ſays biſhop Atterbury, "was a continual warfare; he was engaged againſt the united forces of the papal world, and he ſtood the ſhock of them bravely, both with courage and ſucceſs. He was a man certainly of high endowments of mind and great virtues: he had a vaſt underſtanding which raiſed him up to a pitch of learning unknown to the age in which he lived; his knowledge in ſcripture was admirable, his elocution manly, and his way of reaſoning with all the ſubtilty that theſe plain truths he delivered would bear, his thoughts were bent always on great deſigns, and he had a reſolution fitted to go through with them, and the aſſurance of his mind was not to be ſhaken or ſurpriſed, and that παρρησια of his (for I know not what elſe to call it) before the diet of Worms, was ſuch as might have become the days of the apoſtles. His life was holy, and, when he had leiſure for retirement, ſevere; his virtues active chiefly, and homilitical, and not thoſe lazy ſullen ones of the cloiſter. He had no ambition but in the ſervice of God: for other things, neither his enjoyment nor wiſhes ever went higher than the bare conveniences of living. He was of a temper particularly averſe to covetouſneſs, or any baſe ſin, and charitable even to a fault, without reſpect to his own occaſions. If, among this crowd of virtues, a failing crept in, we muſt remember that an apoſtle himſelf had not been irreproachable; if, in the body of his doctrine, one flaw is to be ſeen, yet the greateſt lights of the church, and in the pureſt times of it, were, we know, not exact in all their opinions. Upon the whole, we have certainly great reaſon to break out in the phraſe of the prophet and ſay, "How beautiful, upon the mountains, are the feet of him that bringeth glad tidings." Gibbon, ſpeaking of the effects produced by the exertions of Luther and his contemporaries, ſays, "The philoſopher muſt own his obligations to theſe fearleſs enthuſiaſts. 1. By their hands the lofty fabric of ſuperſtition, from the abuſe of indulgences to the interceſſion of the Virgin, has been levelled with the ground. Myriads of both ſexes of the monaſtic profeſſion were reſtored to liberty and the labours of ſocial life. 2. The chain of authority was broken which reſtrains the bigot from thinking as he pleaſes, and the ſlave from ſpeaking as he thinks. The popes, fathers, and councils were no longer the ſupreme and infallible judges of the world; and each Chriſtian was taught to acknowledge no law but the ſcriptures, no interpreter but his own conſcience."

The works of Luther, in the Latin and German languages, were collected and publiſhed in an uniform edition, at Jena, in 1556, in four volumes folio; and in 1572 they were printed at Wittemburg, in ſeven volumes folio. Luther left behind him three ſons and a widow. The latter ſurvived him nearly ſeven years. When the war broke out Catharine wandered about in exile with her children, in difficulties and dangers: ſhe experienced the ingratitude of many, from whom expecting kindneſſes, on account of her huſband's great merits towards the church, ſhe was frequently diſappointed. At length, the plague raging at Wittemburg, and the infection having reached her own houſe, ſhe removed to Torgau, that ſhe might preſerve her children from the diſorder. On her way thither the horſes in the carriage took fright; to avoid, what ſhe conceived, a greater danger, ſhe leaped into the road, and falling into a pool of water, was dreadfully bruiſed, and contracted an illneſs, which in a few weeks terminated her life. Preface to Luther's works: MS. tranſlation of Melchior Adams Life of Luther. Bayle. Robertſon. Hume. Gibbon.

Martin Luther, with reſpect to eccleſiaſtical muſic, being himſelf a lover and judge of the art, was ſo far from baniſhing it from the church, that he augmented the occaſion for its uſe. In 1521 he procured the abolition of the ancient maſs at Wittemburg. In 1523 Lutheraniſm was eſtabliſhed in Denmark and Sweden; and, in 1525, Saxony, Brunſwick, Heſſe, Straſburg, and Frankfort. But though he inſtituted a new liturgy, the eccleſiaſtical tones ſtill regulated the muſic of his church at the time of the reformation, and moſt of the old melodies to the evangelical hymns are compoſed in ſome of them.

The Cantaten, or anthems and ſervices of the reformed church, in the German language, are, however, as elaborate and florid as the motets to Latin words, uſed in Italy during the celebration of the maſs. But in the hymnologia, and metrical pſalmody of this, as well as all other Proteſtant churches, there ſeems to have been one common principle, totally inimical to poetry, which is that of deſtroying all quantity and diſtinction of ſyllables, by making them all of the ſame length.

"Theſe *equal ſyllables* alone admire,
Though oft the ear the open vowels tire."
Pope.

The modern Methodiſts, indeed, have introduced a light and ballad-like kind of melody into their tabernacles, which ſeems as much wanting in reverence and dignity, as the pſalmody of other ſects in poetry and good taſte.

Muſic, in itſelf an innocent art, is ſo far from corrupting the mind, that, with its grave and decorous ſtrains, it can calm the paſſions, and render the heart more fit for ſpiritual and pious purpoſes; particularly when united with language, and the precepts of religion. It has been ſaid, not improperly, that "Muſic, conſidered abſtractedly, is in itſelf a language;" and we may add, that it is more univerſally underſtood by mankind in general, whoſe nerves vibrate in uniſon with its ſelected tones, than any other language among all the dialects of the earth. That articulation muſt be rough and violent indeed, which, without ſinging, can eaſily be comprehended in buildings ſo vaſt as ſome of the Chriſtian churches; in ſuch, it is the *ſpirit*, not the *letter* of ſupplication or thankſgiving, which muſt employ the mind. St. Paul ſays, "I will ſing with the *ſpirit*, and I will ſing with the *underſtanding* alſo." As there never was a national religion without muſic of ſome kind or other, the diſpute concerning that which is moſt fit for ſuch ſolemnities, is reduced to one ſhort queſtion. If muſic be admitted into the ſervice of the church, is that ſpecies of it which the moſt poliſhed part of mankind regard as *good*, or that which they regard as *bad*, the moſt deſerving of ſuch an honour?

That metrical pſalmody, in ſlow notes of equal length, had its origin in Germany, and was brought thence by reformers to other parts of Europe, is demonſtrable: for the 128th Pſalm, "Beati omnes qui timent Dominum," had been tranſlated into German verſe, in order to be ſung in this manner, by John Huſs, in the beginning of the fifteenth century; which tranſlation was afterwards modernized in the ſame meaſure, and to the ſame tune, by Luther. And the ſame melody which we ſing to the 100dth pſalm, is not only given to the 134th, in all the Lutheran pſalm-books, but by Goudimel and Claude le Jeune, in thoſe of the Calviniſts; which nearly amounts to a proof that this favourite melody was not produced in England. It is ſaid to have been the opinion of Handel, that Luther himſelf was its author; but of this we have been able to procure no authentic proof. Tradition, however, gives to this celebrated Hereſiarch, as he is called by the Roman Catholics, ſeveral of the ancient melodies which are ſtill uſed in Germany.

LUTHERANISM, in *Eccleſiaſtical Hiſtory*, the ſentiments of Dr. Martin Luther, and his followers, with regard to religion. See the biographical article LUTHER, under which article we have given an account of the life and labours of this eminent reformer; and of the commencement and foundation of that memorable rupture and revolution in the church, which humbled the grandeur of the lordly pontiffs, and eclipſed ſo great a part of their glory. See REFORMATION.

It has been ſaid indeed by F. Paul, in his Hiſtory of the Council of Trent, p. 5, and after him by Mr. Hume, in his Hiſtory of England, vol. i. p. 119, as well as by others, that the Auſtin friars had been uſually employed in preaching indulgences in Saxony; but that Arcemboldi, a Genoeſe merchant, who was employed by Magdalen, the ſiſter of Leo, to whom he had granted the profits ariſing from the ſale of indulgences in Saxony, to collect the money which ſhould be raiſed, and his deputies, hoping to gain more by committing this truſt to the Dominicans, had bargained with Tetzel; and that Luther was prompted at firſt to oppoſe Tetzel and his aſſociates, and to deny indulgences, by a deſire of taking revenge for this injury offered to his order. Such was the repreſentation of Boſſuet; and other writers, miſled by his authority, have circulated a ſimilar opinion. It is proper, therefore, to obſerve, that the profits ariſing from indulgences in Saxony and the adjacent countries were granted, not to Magdalen, the ſiſter of Leo, but to Albert, archbiſhop of Mentz, who had the ſole right of nominating thoſe who publiſhed them: moreover, Arcemboldi never had any concern in the publication of indulgences in Saxony; becauſe his diſtrict was Flanders and the Upper and Lower Rhine. Beſides, the publication of indulgences in Germany was not uſually committed to the Auguſtinians: from the year 1229, that lucrative commiſſion was principally intruſted with the Dominicans; and they had been employed in the ſame office a ſhort time before the preſent period: the promulgation of them, at three different periods under Julius II. was granted to the Franciſcans, and the guardian of the Franciſcans was joined in the truſt with Albert on this occaſion, though he refuſed to accept it: and it is remarkable, that for half a century before Luther, *viz.* from 1450 to 1517, the name of an Auſtin friar employed in this ſervice occurs but once. To theſe facts it may be added, that it is far from being probable, that Luther would have been ſolicitous about obtaining for himſelf or his order, a commiſſion of this kind, at a time when the preaching of indulgences was become very unpopular; inſomuch that all the princes of Europe, and many biſhops, as well as other learned men, abhorred the traffic; and even the Franciſcans and Dominicans, towards the concluſion of the fifteenth century, oppoſed it publicly, both in their diſcourſes and writings: nor was this commiſſion given to the Dominicans in general, but ſolely to Tetzel. Finally, Luther was never accuſed of oppoſing the publication of indulgences from reſentment or envy, either in the edicts of the pontiffs of his time, or in the reproaches of his contemporary writers, who defended the cauſe of Rome from the year 1517 to 1546, and who were far from being ſparing of their invectives and calumnies. The reader may find this matter fully ſtated by Dr. Maclean, the tranſlator of Moſheim's Eccleſiaſtical Hiſtory, in vol. iv. p. 31. note (*p*) 8vo. edit. 1790, and by Dr. Robertſon in his Hiſt. of Ch. V. vol. ii. p. 125. note (*), 8vo. edit.

Lutheraniſm was formed in the manner ſtated under the article LUTHER; the adherents to which were called Lutherans, from Lutherus, a name which has a Greek turn, and which this great reformer aſſumed in lieu of his family name *Lotter*, or *Lauther*; it being the cuſtom of thoſe days for men of learning to give themſelves Greek names; ſuch were Eraſmus, Melancthon, Bacon, &c.

For a full and accurate account of the riſe and progreſs of Lutheraniſm, the reader may conſult Moſheim and Robertſon, ubi ſupra. See PROTESTANTS and REFORMATION.

Lutheraniſm has undergone ſome alteration ſince the time of its founder. Luther rejected the epiſtle of St. James, as inconſiſtent with the doctrine of St. Paul, in relation to juſtification; he alſo ſet aſide the Apocalypſe; both which are now received as canonical in the Lutheran church.

Luther reduced the number of ſacraments to two, *viz.* baptiſm, and the euchariſt; but he believed the impanation, or conſubſtantiation: that is, that the matter of the bread and wine remain with the body and blood of Chriſt; and it is in this article, that the main difference between the Lutheran and Engliſh churches conſiſts.

Luther maintained the maſs to be no ſacrifice; he exploded the adoration of the hoſt, auricular confeſſion, meritorious works, indulgences, purgatories, the worſhip of images, &c. which had been introduced in the corrupt times of the Romiſh church. He alſo oppoſed the doctrine of free-will; maintained predeſtination; aſſerted that we are neceſſitated in all we do; that all our actions done in a ſtate of ſin, and even the virtues themſelves of heathens, are crimes; that we are only juſtified by the imputation of the merits and ſatisfaction of Chriſt. He alſo oppoſed the faſtings in the Romiſh church, monaſtical vows, the celibacy of the clergy, &c.

Some authors reckon thirty-nine different ſects, which at different times have ſprung up among the Lutherans.

LUTHERANS, a ſect of Proteſtants who profeſs Lutheraniſm, or adhere to the doctrine and tenets of Luther.

The Lutherans, of all Proteſtants, are thoſe who differ leaſt from the Romiſh church; as they affirm, that the body and blood of Chriſt are materially preſent in the ſacrament of the Lord's ſupper, though in an incomprehenſible manner; and likewiſe repreſent ſome religious rites and inſtitutions, as the uſe of images in churches, the diſtinguiſhing veſtments of the clergy, the private confeſſion of ſins, the uſe of wafers in the adminiſtration of the Lord's ſupper, the form of exorciſm in the celebration of baptiſm, and other ceremonies of the like nature, as tolerable, and ſome of them as uſeful. The Lutherans maintain, with regard to the divine decrees, that they reſpect the ſalvation or miſery of men, in conſequence of a previous knowledge of their ſentiments and characters, and not as free and unconditional, and as founded on the mere will of God. Towards the cloſe of the laſt century, the Lutherans began to entertain a greater liberality of ſentiment than they had before adopted; though in many places they perſevered longer in ſevere and deſpotic principles than other Proteſtant churches. Their public teachers now enjoy an unbounded liberty of diſſenting from the deciſions of thoſe ſymbols or creeds, which were once deemed almoſt infallible rules of faith and practice, and of declaring their diſſent in the manner they judge the moſt expedient. Moſheim attributes this change in their ſentiments to the maxim, which they generally adopted, that Chriſtians were accountable to God alone for their religious opinions; and that no individual could be juſtly puniſhed by the magiſtrate for his erroneous opinions, while he conducted himſelf like a virtuous and obedient ſubject, and made no attempts to diſturb the peace and order of civil ſociety. Eccl. Hiſt. vol. iv. p. 440. Eng. ed. 8vo.

LUTHERN, from the French *lucarne*, of the Latin *lucerna*, *light*, or *lantern*, a kind of window over the cornice, in the roof of a building; ſtanding perpendicularly over the naked of the wall; and ſerving to illuminate the upper ſtory.

The French architects diſtinguiſh theſe into various kinds, according to their various forms; as *ſquare*, *ſemicircular*, *bulls' eyes*, *flat arches*, *Flemiſh lutherns*, &c.

LUTHIER, *Fr.* implies not only a lute maker, but a maker of all ſtringed and bowed inſtruments.

LUTI, Benedetto, in *Biography*, a Florentine, was the diſciple of Gabbiani, and from him went to Rome, to put himſelf under the direction of Ciro Ferri; but being diſappointed by his death, formed a ſtyle of his own, the reſult of various imitations; ſelect in deſign, amene and lucid in colour, well contraſted by maſſes of light and ſhade, and harmonious to the eye.

He painted not without merit in freſco, and with greater merit in oil "Cain flying from his murdered Brother," has ſomething of the ſublimity and the pathos that ſtrike in the Pietro Martyre of Titian, and his Pſyche in the gallery of the Capitol, breathing refinement of taſte and elegance. He died in 1724, at the age of 58. Fuſeli's Pilkington.

LUTKENBORG, in *Geography*, a town of the duchy of Holſtein; 30 miles N. of Lubeck.

LUTOMIRSK, a town of the duchy of Warſaw; 18 miles S.S.E. of Lenciez.

LUTON, a conſiderable market-town and pariſh in the hundred of Flitt, Bedfordſhire, England, is ſituated among ſome hills on the banks of the river Lea, three miles from Dunſtable, and 31 from London. The town is long and irregular, ſhaped ſomething like the Roman Y, the angles branching off from the market-houſe, which is an extenſive building. The population of the pariſh, according to the return in the year 1801, was 3095, inhabiting 612 houſes, which are but indifferently built. The only ſtructure in the town deſerving attention is the church, which conſiſts of a choir, a nave and two aiſles, ſupported by ten pointed arches, two tranſepts, and a handſome embattled tower at the weſt end, chequered with flint and free-ſtone; at the corners are hexangular turrets, ſimilar to that at Dunſtable. The arch of the weſt door is ornamented with mouldings of various flowers, &c. Within the church is a ſingular piece of ancient architecture, an octagonal ſtone font, incloſed in a lofty wooden frame of pointed arches, terminated with elegant tabernacle work. The conſecrated water, during the prevalence of the Roman ceremonies, was kept in a large baſon at the top, whence it was let down by the prieſt, through a pipe into the font. On the inſide of the roof a vine is repreſented, guarded by a lamb from the aſſaults of a dragon: emblematical of the defence which baptiſm affords to the church from the attempts of the devil. On the north ſide of the choir is an elegant chapel, founded by John lord Wenlock, who bore a diſtinguiſhed part in the conteſt between the houſes of York and Lancaſter. The principal manufacture carried on in Luton is that of ſtraw hats: a weekly market, noted for its abundant ſupply of corn, is held on Mondays; it is of great antiquity, being mentioned in the Domeſday Survey, where the tolls are valued at 100*s.* *per annum*: and here are two annual fairs. John Pomfret, the poet, was a native of this town: his father was firſt curate and then vicar of the pariſh.

About three miles from the town, on an elevated ſituation at the border of the Bedfordſhire downs, in the midſt of a well wooded park, ſtands Luton-Hoo houſe, the ſeat of the marquis of Bute. The old park, which conſiſted of about 300 acres, incloſed by ſir Robert Napier, was enlarged to 1200, by the late earl of Bute, and now contains about 1500 acres. The manſion was in a great meaſure rebuilt by the late earl, who employed Mr. Adam the architect. The principal rooms, particularly the library, drawing-room, and ſaloon, are on a magnificent ſcale. The library, which is 146 feet in length, is eſteemed but little inferior to that of Blenheim. The collection of pictures is very large and valuable, chiefly of the Italian and Flemiſh ſchools. The chapel is fitted up with carving in wood, which was originally executed for ſir Thomas Pope at Tittenhanger, Herts, in 1548, and removed to Luton in perfect preſervation by ſir Robert Napier. In the adjoining wood is a portico, a beautiful piece of brick building, deſigned for a manſion intended to have been built by lord Wenlock, but which was never completed: and in the park is a ſtone tower of great antiquity. Beauties of England and Wales, vol. i. Lyſons's Magna Britannia, vol. i.

LUTRA, in *Zoology*, a ſpecies of *Muſtela*. See Muſtela *Lutra*, and Otter.

LUTRY, in *Geography*, a pleaſant little town of Switzerland, in a diſtrict of the Pays de Vaud, between Lauſanne and Vevay, called "La Vaux," on the N. coaſt of the lake of Geneva; three miles E. of Lauſanne.

LUTTENBERG, a town of the duchy of Stiria, on the river Stantz; 12 miles E. of Pettau. N. lat. 46° 35'. E. long. 16° 8'.

LUTTER, a town of Weſtphalia, in the duchy of Brunſwick; 11 miles N.W. of Goſlar.

LUTTERBERG, a town of Weſtphalia, in the principality of Grubenhagen, formerly a county; 15 miles S. of Goſslar.

LUTTERHAUSEN, a town of the duchy of Holſtein; eight miles from Hamburgh.

LUTTERLOCK, a townſhip of America, in Orleans county, Vermont, N. of Craftſborough.

LUTTERWORTH, the only market town in the hundred of Guthlaxton, Leiceſterſhire, England, is ſituated on the bank of the river Swift; about two miles from the Watling-ſtreet road, 13 miles from Leiceſter, and 83 from London. Leland deſcribes this "towne as ſcant half ſo bigge as Lughborow; but in it there is an hoſpital of the foundation of two or three of the Verdounes, that were lords of auncient tyme of the towne." This hoſpital was founded, in the reign of king John, by Roiſe de Verdon and Nicholas her ſon, for a prieſt and ſix poor men, and to "keep hoſpitality for poor men travelling that way." The pariſh church of Lutterworth is a ſpacious ſtructure, with a nave, two aiſles, a chancel, and a tower with four turrets. The chancel, which is ſeparated from the nave by a beautiful ſcreen, is ſuppoſed by Burton to have been built by lord Ferrers of Groby, as his arms are cut on the outſide over the great window. By a ſtorm, in the year 1703, the ſpire, which was 50 feet higher than the preſent turrets, was blown down, and, falling on the roof of the church, did great damage to the body, pews, &c. About the year 1740, the whole was repaired, a pavement of checquered ſtone laid, and all the interior made new, except the pulpit, which is of thick oak planks, of an hexagonal ſhape, and has a ſeam of carved work in the joints; this pulpit is preſerved with great veneration, in memory of the diſtinguiſhed reformer, John Wickliffe, who was rector of this pariſh, and died ſuddenly while hearing maſs December 31ſt, 1387. The chair in which he breathed his laſt is alſo preſerved with great care; as is likewiſe another relic uſed by him, the communion cloth of purple velvet trimmed with gold. His body was buried in this church; but his doctrines having been condemned, his remains were taken up and burned, by order of the council of Sienna, in 1428, and his aſhes caſt into the river. His portrait, by S. Fielding, hangs over the gallery at the weſt end of the church. A meeting-houſe for diſſenters was built here in 1777, and is numerouſly attended. Here are alſo a ſchool-houſe and alms-houſe, built by the bequeſt of Mr. Edward Sherrier. Among other benefactions to this town, Mr. Richard Elkington, by his will, dated May 29th, 1607, left in truſt to the mayor, bailiff, and burgeſſes of Leiceſter 50*l.* to be lent in ſums of 10*l.* each to five tradeſmen of Lutterworth for one year at five *per cent.*; the intereſt to be diſtributed among certain poor perſons. In the return to the population act in 1801, this town was ſtated to contain 277 houſes and 1652 inhabitants. The cotton manufacture is carried on here to conſiderable extent; and ſome large buildings have been lately erected as factories and workſhops. Many hands are alſo employed in making ſtockings. A weekly market is held on Thurſdays, granted, with an annual fair, by king Henry V. in the ſecond year of his reign; three other fairs have ſince been obtained.

About a mile to the eaſt of Lutterworth is Miſterton Hall, the ſeat of Jacob Henry Franks, eſq. who poſſeſſes a collection of pictures. Nichols's Hiſtory of Leiceſterſhire. Beauties of England and Wales, vol. ix.

LUTUM, in *Botany*, a name given by the ancient Roman authors to a plant ſince called *luteola*, or dyer's-weed, and by authors of later date *carniola*, and *cymene*. It is uſed at this time to dye things yellow, and was ſo by the ancient Greeks, who expreſsly mention the dyeing woollen cloth with it. The Roman courtezans had alſo a way of dyeing their hair yellow with it. See RESEDA.

LUTUM *Sapientiæ* is the hermetical ſeal; made by melting the end of a glaſs veſſel by a lamp, and twiſting it up with a pair of pliers.

LUTZELSTEIN, in *Geography*. See *La* PETITE PIERRE.

LÜTZEN, a town of Saxony, in the territory of Merſeburg, with a citadel. Near this town was fought a bloody battle in 1632, between the Imperialiſts and Swedes, in which the latter loſt their king Guſtavus Adolphus; nine miles E.S.E. of Merſeburg. N. lat. 51° 16′. E. long. 12° 8′.

LUVINO, a town of Italy, in the department of the Verbano, on the E. bank of the lake Maggiore; 20 miles N.W. of Como.

LUVINO, *Valley of*, one of the five diſtricts into which the county of Bormio is divided. (See BORMIO.) The inhabitants of the Luvino poſſeſſed certain privileges, particularly the power of judging civil cauſes within a certain value; but they did not appoint any of the magiſtrates, who were all choſen from the other four diſtricts.

LUVIO, a town of Sweden, in the government of Abo; nine miles S.S.W. of Biorneborg.

LUXATION, or DISLOCATION, in *Surgery*, denotes any caſe where the articular extremities of bones abandon their natural relations, whether the head of a bone eſcapes from a cavity deſtined for its reception, or whether the ſurfaces of the joint ceaſe to correſpond properly one to the other. A luxation is termed *complete*, when the ſurfaces of the joint are totally ſeparated; *incomplete*, when they remain partially in contact, though in a ſtate of diſplacement, with reſpect to each other. Like fractures, diſlocations are alſo divided into *ſimple* and *compound*; ſimple, when there is no external wound communicating with the joint; compound, when the caſe is conjoined with ſuch an accident.

Other general differences of luxations depend upon the articulation in which they take place; the direction in which the bone is diſplaced; the length of time the accident has continued; and the cauſe that has produced it.

The greater the extent and variety of motion of joints, the more ſubject they are in general to be diſlocated. Thus, the orbicular articulations, ſuch as that of the humerus with the ſcapula, are thoſe in which luxations are moſt frequent. In the ginglimoidal articulations, on the contrary, which admit only of motion in two oppoſite directions, the accident is far leſs common; and in ſuch joints as only allow a ſlight yielding motion of the bones on each other, a diſlocation ſtill more rarely occurs. The frequency of luxation, however, in the orbicular articulations, and the comparative unfrequency of them in the ginglimoidal, as Boyer rightly obſerves, may be explained from many circumſtances, independent of the quantity and variety of motion which ſuch joints admit of. In the ginglimoidal, the bony ſurfaces, which come into contact, and are adapted to one another, are of conſiderable extent; the ligaments which bind them together are very numerous and ſtrong; and the muſcles are ſo arranged, as to have a ſhare in ſtrengthening ſuch articulations.

We have mentioned, that luxations are diſtinguiſhed into *complete* and *incomplete*, the latter term being uſed, when the ſurfaces of the joint are yet partially in contact, though diſplaced and not exactly correſponding. Incomplete luxations only happen in the ginglimoidal articulations, as thoſe of the foot, the knee, and the elbow. In theſe joints, indeed, the diſlocation is almoſt always incomplete; as it could only be made complete by the operation of a vaſt force. With reſpect to the orbicular joints, it is very different, as few of them are ſubject to any diſlocation, that is not complete. If the head of the humerus, or thigh-bone, is forced on the cartilaginous brim, ſurrounding the cavity deſtined for its reception, the round ſlippery ball only touches the part on which it reſts by a few points, and, therefore, either re-enters its natural ſocket again, or ſlips entirely from it; in the latter event, of courſe the luxation is complete.

But as M. Boyer has noticed, there are ſome articulations which, though truly orbicular, are yet liable to incomplete luxations. For inſtance, the head of the aſtragalus may be ſo diſplaced, as only to abandon, in a partial manner, the cavity in the poſterior ſurface of the os naviculare. However, in this example, the orbicular ligament is tight, very ſtrong, and the motion inconſiderable. Laſtly, it may be obſerved, with regard to the extent of diſlocations, that when the head of a bone is entirely thrown out of the cavity, in which it is naturally placed, it may be forced to a greater or leſs diſtance between the interſtices of the muſcles.

On the ſubject of the different directions, in which a bone may be diſplaced, we have to ſtate, that, in the round articulations, it may be luxated in the direction of all the radii, which paſs from the centre of the circle formed by the circumference of the articular cavity. In fact, there is not a point of the edge of the glenoid cavity where the humerus may not eſcape. However, owing to particular circumſtances of conformation, a luxation moſtly takes place in certain directions, well aſcertained by experience, ſo that the varieties of diſlocations, diſtinguiſhed by the courſe of the diſplaced bone, are, as Boyer well explains, much leſs numerous than might at firſt be ſuppoſed. The terms *upwards, downwards, forwards, backwards, inwards*, and *outwards*, are frequently applied to luxations, as denoting the direction in which the head of a bone is diſplaced. Ginglimoid joints are generally ſuſceptible of being diſlocated only in the direction of two lines, namely, a tranſverſe one, and one extending from the front to the back of the articulation.

The length of time a diſlocation has exiſted makes a difference of the higheſt importance, the difficulty of cure increaſing in proportion to the time the accident has been left unreduced; and, indeed, after a certain time, the reduction becomes impracticable.

The ſoft parts and the bone itſelf have acquired a certain poſition, and the ligaments and muſcles ſurrounding the diſeaſed joint become ſtiff, and yield with difficulty to the efforts made to reduce the bone. If a certain number of days have elapſed, the laceration in the ligaments may have become ſo far cloſed as to render the reduction impoſſible. Laſtly, the head of the bone may have become firmly adherent to the parts, amongſt which it has been forced.

Luxations, in general, may be complicated with a greater or leſs degree of contuſion, with a wound or fracture, with a rupture of a blood-veſſel and conſequent effuſion of blood in the cellular ſubſtance, with contuſion of an important nerve, and a paralyſis of the organs to which it is diſtributed, &c.

The following general account of the cauſes, ſymptoms, prognoſis, and treatment of luxations, is chiefly from Boyer's lectures on the diſeaſes of the bones.

The cauſes are divided into external and internal; both are prediſpoſing or occaſional.

The prediſpoſition to luxation may depend on circumſtances natural or accidental. The natural are, the joint admitting of great latitude of motion, the ſmall extent of ſurfaces by which the bones are in contact, the laxity and ſmall number of the ligaments uniting them, the weakneſs of one ſide of an articulation ariſing, for inſtance, from a great notch on one ſide, as is obſerved at the interior and inferior part of the acetabulum, diſeaſe, ſuch as a paralyſis of the muſcles, which ſurround an articulation, and a weakneſs and relaxation of its ligaments, may alſo occaſion a prediſpoſition to diſlocations. In a paralyſis of the deltoid muſcle, the weight of the arm alone has been known to produce an elongation and gradual relaxation of the capſular ligament of the ſhoulder joint, and to remove the head of the humerus two or three inches from the glenoid cavity of the ſcapula. Boyer has obſerved in a child that laboured under an atrophia of the muſcles of the arm, an empty ſpace of nearly an inch between the head of the bone and the ſurface of the glenoid cavity, which could be diſtinctly felt through the emaciated deltoid muſcle.

Sometimes the relaxation of the ligaments appears without any evident cauſe, and gives ſuch a diſpoſition to luxations, that they take place from the ſlighteſt cauſes; ſuch was the caſe of a woman who could not yawn even moderately, without luxating the lower jaw. It may not be amiſs to obſerve that theſe luxations, depending on exceſſive looſeneſs of the ligaments, are, by reaſon of ſuch looſeneſs, in general very eaſily reduced. A diſeaſed ſtate of joints may alſo diſpoſe to luxations, by deſtroying the ligaments and articular ſurfaces. What ſurgeon of any experience at all has not frequently ſeen examples in which the head of the thigh-bone has been diſlocated, in conſequence of diſeaſe in the hip? Even the knee, which is a ginglimoidal joint, ſometimes becomes partially luxated in caſes of white ſwelling.

In order that external violence, a blow, a fall, or even the action of the muſcles, produce luxation in a ball and ſocket articulation, the axis of the bone muſt be placed in a direction, more or leſs oblique, with reſpect to the ſurface with which it is articulated. If, for example, the os humeri hangs exactly along the ſide of the body, or perpendicularly with reſpect to the glenoid cavity of the ſcapula, no force can produce a luxation. If a perſon falls on the elbow, while the fore-arm is in this poſition, the head of the humerus will be forced againſt the cavity formed for its reception; but if the arm is lifted more or leſs from the body, the axis of the humerus will fall obliquely on the ſurface of the glenoid cavity, and the eſcape of the head of the bone from ſuch cavity will be facilitated. This tendency to a diſlocation will be increaſed in proportion as the angle formed by the axis of the bone with the ſurface of the glenoid cavity deviates from a right angle. In the ginglimoidal articulations luxations may be cauſed by a fall, or other kinds of external violence, and they are moſtly incomplete. In the orbicular joints the action of the muſcles has conſtantly a ſhare in the production of the accident. Thus, for inſtance, if a perſon falls on the elbow, whilſt the arm is raiſed from the body, and carried directly outwards, the ſhock which this part receives will certainly tend very much to force the head of the humerus out of the glenoid cavity on the lower and internal ſide; but the action of the pectoralis major, latiſſimus dorſi, and teres major, contributes alſo very much to throw the bone out of its place. In fact the elbow, reſting on the ground, becomes the fulcrum, or centre of motion of the humerus; in this ſtate, we obey a mechanical inſtinct, which leads us ſuddenly to bring the arm cloſe to the body, and as the reſiſtance made by the ground prevents this, the violent and inſtantaneous contraction of the pectoralis major, latiſſimus dorſi, and teres major, draws downwards and inwards the head of the humerus; the luxation being thus partly the effect of the fall, and partly the effect of ſuch muſcular action. Whatever may be the manner in which the cauſes act, luxations are always accompanied with more or leſs laceration of the ligaments, and injury of the other ſoft parts about the joint; and in the orbicular articulations, like thoſe of the ſhoulder and hip, the capſular ligaments are always torn.

With reſpect to the general ſymptoms of luxations we need not dwell much upon pain and inability of moving the limb, as, at moſt, they are only equivocal, and common to diſlocations, fractures, and ſimple bruiſes. They are not, however, to be entirely overlooked, but ſtill in forming a diagnoſis we ſhould endeavour to found it on the exiſtence of ſymptoms manifeſt to the ſenſes, ſuch as an elongation or ſhortening of the limb; a change in its ſhape and direction; and laſtly, the abſolute impoſſibility of performing certain motions.

A luxation cannot poſſibly exiſt, unleſs the affected limb is either lengthened, as happens in the lower extremity, when the head of the femur paſſes out of the acetabulum, in the direction downwards and inwards, and reſts on the foramen ovale; or ſhortened, as takes place when the ſame bone is luxated upwards and backwards, and has its head thrown towards the external depreſſion in the ilium. But it is to be remarked, that the ſhortening and elongation are rarely produced, except by luxations of orbicular joints. However, the abſence of theſe ſymptoms in diſlocations of the ginglimoidal articulations is amply compenſated by the ſuperficial ſituation of the bone; a circumſtance which renders it eaſy to aſcertain their relative poſitions.

The direction of the bone is changed, for the luxated end cannot leave its natural place, without the other being thrown into a contrary direction. Thus, in the luxation of the humerus downwards and inwards, the poſition of the arm is obliquely downwards and outwards, inſtead of being ſtraight along the ſide. This mode of judging of the occurrence of a diſlocation by the change in the direction of the limb, is much eaſier in recent caſes, than in thoſe which have continued for a conſiderable time.

As the ſituation and direction of a diſlocated bone are altered, it neceſſarily follows that ſome muſcles muſt be preternaturally relaxed, while others are overſtretched and ſtrained, as may be ſeen with reſpect to the deltoid muſcle, in caſes of luxations of the humerus, which are the moſt frequent of all. This unequal tenſion and relaxation of muſcles may alſo afford ſome aſſiſtance in forming the diagnoſis.

Time ſeems, however, ſomething to remove, in a great meaſure, the alteration produced in the contour of a limb, by certain luxations; and it is obſerved that in old diſlocations of the humerus, the fulneſs of the ſhoulder, juſt below the acromion, is in ſome degree reſtored.

In theſe alterations of the natural ſhape of the limbs, we are to comprehend the changed relations of the eminences of a joint with reſpect to each other; the exiſtence of projections in places, where there ought to be depreſſions; and of depreſſions where there ought to be eminences. Thus, in the luxation of the humerus inwards and downwards, a hard tumour cauſed by the head of the bone itſelf, may be diſtinctly felt in the hollow of the axilla, while an unnatural depreſſion may be perceived juſt under the acromion.

Our limbs, even when fractured, as Boyer has obſerved, may be made to perform ſeveral motions, and may be put into various attitudes. In a caſe of a broken thigh, the ſurgeon (not, in truth, without cauſing ſevere pain,) may, by taking hold of the leg, move it round in a circular direction, and may point the foot inwards and outwards. But in luxations of the thigh, ſuch motions are altogether impoſſible, before the bone is reduced.

By a conſideration of all theſe ſymptoms, diſlocations may always be detected. When the caſe is not aſcertained within a moderate time, either through negligence or ignorance, it is a ſerious affair for the patient; becauſe the inability of uſing the limb is imputed to the contuſion, and the treatment is regulated accordingly; the bone, after a time, becomes incapable of reduction, and the lameneſs and deformity are then irremediable. Such ſurgeons as are groſsly deficient in anatomical knowledge, are the moſt liable to deliver wrong opinions concerning diſlocations; for, not being able to judge of the due relative diſtances which ought to exiſt between certain proceſſes of the bones, they are not at all qualified to decide whether many caſes are mere contuſions, or whether they are fractures or diſlocations.

On the ſubject of prognoſis in caſes of diſlocation, it is remarked that luxations of the orbicular joints are much leſs dangerous than thoſe of the ginglimoidal articulations. As the action of the muſcles has a great ſhare in producing the firſt deſcription of caſes, there is leſs violence done to the external parts, and the ſoft parts are leſs lacerated.

In all caſes the extent of the evil is in proportion to the largeneſs of the ſurfaces of the joint, the number and ſtrength of the ſurrounding muſcles, and the thickneſs and number of the ligaments. Hence, luxations of the foot and knee are more dangerous than thoſe of the elbow and wriſt; the former require a much greater degree of external violence to produce them, and conſequently the ſoft parts are more injured.

Luxations of the orbicular joints are more difficult of reduction than thoſe of the ginglimoidal articulations, and diſlocations of the hip are more troubleſome to reduce than luxations of the ſhoulder. Theſe circumſtances are explicable by the power and action of the muſcles, in reſiſting the endeavours of the ſurgeon to bring the head of the bone into its place again.

But, perhaps, the thing which, of all others, tends moſt to increaſe the danger of a diſlocation, is the accident being, what is termed *compound*, that is, attended with an external wound, communicating with the cavity of the luxated joint. Many ſuch caſes require immediate amputation. The propriety of the operation depends, however, in a great meaſure on the extent of injury done to the ſoft parts. When theſe have not been largely lacerated, torn, and contuſed, the ſurgeon ſhould endeavour to ſave the limb. Even the hazard of a compound diſlocation very much depends on the kind of joint affected. Such injuries of the articulations of the fingers or toes cannot be compared, in point of danger, with ſimilar accidents intereſting the ankle, the knee, or the elbow.

Luxations ariſing from diſeaſe of a joint, cannot in general be reduced and cured like diſlocations from external violence; for the ligaments and articular ſurfaces are, in fact, always more or leſs deſtroyed. This obſervation, however, is not to be extended to luxations, induced by a mere looſeneſs of the ligaments. Theſe caſes indeed are very ſubject to recur; but they can eaſily be reduced. Many diſlocations of the jaw are connected with a lax ſtate of the ligaments, and afford an illuſtration of the preceding remark.

Laſtly, the danger of diſlocations in general is much influenced by the degree of contuſion preſent, and by the injury done to blood-veſſels, or large nerves. The latter violence ſometimes occaſions a paralyſis of the muſcles, to which the injured nerves ſends its filaments. Boyer has ſeen a paralyſis of the deltoid muſcle brought on by a violent contuſion of the circumflex nerve, in a luxation of the humerus downwards and inwards.

We have now to conſider the general treatment of luxations.

To reduce the diſlocated bone, keep it in its place, and prevent or remove the ſymptoms with which the luxation may be complicated, form the three indications which are to be fulfilled in the treatment of luxations. The reduction is accompliſhed, as in caſes of fracture, by three means, oppoſite in their action, but tending to the ſame end, *viz.* extenſion, counter-extenſion, and coaptation.

In the article Fracture we have expatiated a good deal on relaxing the muſcles connected with the broken bone, in order to facilitate the reduction of the fracture. This great principle, which was ſo much and ſo juſtly urged by Mr. Pott, holds equally good in caſes of diſlocation. From the action of the muſcles principally ariſe all the trouble and difficulty which attend the reduction of luxated joints. The mere bones, compoſing the articulations, or the mere connecting ligaments, would in general afford very little oppoſition. It is the muſcles that chiefly oppoſe the reduction, and their reſiſtance muſt either be eluded or overcome; terms, ſays Mr. Pott, of very different import, and which every practitioner ought to be well apprized of. We ſcarcely need add, that this eminent ſurgeon was a ſtrong advocate for relaxing the muſcles belonging to the diſlocated joint, at the time of attempting to reduce the bone. Now, although this precept is, generally ſpeaking, moſt excellent as far as it is practicable; we are not to run away with the idea that things are preciſely as Mr. Pott has repreſented them to be, in his general remarks on fractures and diſlocation. No ſurgeon, of the preſent time, is ſo abſurd as to imagine that merely bending the elbow, or the knee, will relax all the muſcles which have the power of reſiſting the reduction of a diſlocated ſhoulder or hip. Neither will the moſt advantageous poſition for extenſion always allow the poſture to be entirely regulated with a view towards the relaxation of the muſcles. While, however, we profeſs theſe ſentiments, we feel a thorough conviction that attending to the relaxation of ſuch muſcles as have the greateſt power of oppoſing the reduction of a diſlocation, is an unobjectionable maxim, as far as it can be received in actual practice, conſiſtently with ſome other equally important objects. When Mr. Pott wrote ſo ſtrenuouſly in favour of relaxing the muſcles, or, as we ſhould rather ſay, of bending joints, in caſes of diſlocation, it was alſo neceſſary for him to lay much ſtreſs on the advantage of applying the extenſion to the end of the diſlocated bone itſelf; becauſe, were it applied in a better ſituation, the bent poſition would become inadmiſſible. The reaſon which is aſſigned for this practice, however, is, as might be expected, moſt weak. Mr. Pott talks a great deal about the *dilatability*, or *diſtractile power* of the ligaments, and their capacity of giving way when ſtretched or pulled, much more, we think, than facts juſtify, ſince it is the general nature of ligaments, we mean ſuch as actually hold the bones together, to be very ſtrong and unyielding. The capſular ligaments, we think, are generally to be regarded rather as bags for the ſynovia, than as a means of ſtrengthening the articulations. The yielding nature of ſuch ligaments, therefore, can have little to do with the ſubject of diſlocations. Now it appears to us that Mr. Pott was anxious to make the ligaments appear more elaſtic than they really are, in order that he might repreſent all the extending force applied to the bone below the diſlocated one, as being loſt in the intervening unluxated articulation. Even were the ligaments of the knee, for inſtance, to yield in the manner inſinuated by Pott, when the extenſion is applied to the lower part of the leg, the extending force would ſtill not be loſt, but would operate with full effect on the thigh. Where is it loſt? The very circumſtance of the ligaments being on the ſtretch, proves that the force operates on them, and they being attached to the os femoris, this bone cannot fail to receive the extenſion in a degree preciſely equal to that with which the ligaments themſelves receive it. It is extraordinary that reaſoning ſo abſurd ſhould have impoſed upon the generality of ſurgeons in this country; eſpecially as on the continent, its falſity has long ſince been expoſed in the writings of Fabre, Dupony, Deſault, Boyer, and Richerand. The doctrine of Pott is the moſt ancient; but the antiquity of any practice ſhould ceaſe to be a reaſon for a perſeverance in it, the moment the principles, on which it is founded, are proved to be erroneous.

We differ then from Pott, and believe with the moſt conſummate ſurgeons on the continent, that the extending force ſhould be applied, not on the luxated bone, but on that with which it is articulated, and as far as poſſible from it.

All the ancient authors, as Boyer remarks, adviſed applying the extending force on the luxated bone, for inſtance applying it above the knee in luxations of the thigh-bone, and above the elbow in thoſe of the humerus. Many of the moderns have followed their inſtructions; and this mode is found recommended by J. L. Petit and Duverney in their treatiſes on the diſeaſes of the bones. Two members of the Academy of Surgery in France, Fabre and Dupony, ſaw the inconvenience of this practice, and ſubſtituted for it a mode of treatment now generally adopted on the continent. Their practice, which conſiſts in applying the extending force to the bone that articulates with the luxated one, has two moſt important advantages; firſt, the muſcles which ſurround the luxated bone are not compreſſed nor ſtimulated to ſpaſmodic contractions, which would prevent the reduction, not only by oppoſing a force ſuperior to that employed for the purpoſe of reduction, but alſo by retaining the head of the bone engaged in the interſtices of the contracted muſcles. Secondly, the extending force is much more conſiderable than it is in the other method, for, as Dupony has obſerved, by elongating thus the arm of the lever, we acquire a degree of power which the difficulties preſented in a great number of caſes force us to have recourſe to. It is true, ſays Boyer, an apprehenſion has prevailed that the extending force applied at a diſtance from the luxated bone, would loſe in the articulations of the limb a part of its effect. Thus it has been alleged, that a part of the extending force applied at the wriſt, in a luxation of the humerus, is employed in elongating the ligaments of the elbow joint. But this objection is ill founded; all the muſcles which go from the humerus to the bones of the fore-arm, by ſtrengthening the elbow, make it anſwer as a continued lever, along which the force is communicated without any loſs.

Force, applied by the hands of intelligent and ſtrong aſſiſtants, is generally conſidered preferable to any mechanical means in the reduction of diſlocations. The number of aſſiſtants may be increaſed at will, and force proportioned to the reſiſtance that is experienced. Should there not be room for a ſufficient number to take hold of the limb, they may make the extenſion by means of a napkin, or ſheet, folded longitudinally and tied on the limb. It is ſaid that the force employed can be better judged of when the extenſion is made by a certain number of aſſiſtants, than when a multiplied pulley is uſed, which may act with ſuch force, without our being aware that the muſcles, ligaments, and even the ſkin which covers the articulation, may be lacerated, and the moſt direful ſufferings occaſioned.

Although the writer of this article fully aſſents to the general ſuperiority of making the extenſion by the aſſiſtants, he cannot refrain from expreſſing a favourable opinion of the convenience and efficiency of a pulley, in caſes where *intelligent* aſſiſtants are not at hand, and where much force is required for the reduction, as, for inſtance, when the thigh-bone, or humerus, has been out of its place ſome time, or when the patient is very muſcular and ſtrong. At the ſame time, the dangerous conſequences which may happen, when a rough, unſkilful, or impatient practitioner dares to employ a pulley, cannot be too deeply impreſſed upon a ſurgeon's mind. Whether extenſion is made in the ordinary way, or with a pulley, it ſhould be made with moderation, as the muſcles are more ſure of being ſafely overcome by length of reſiſtance than by the exertion of violence.

It is impoſſible to aſſign the preciſe degree of force to be employed; it is to be varied and proportioned, according to the ſtrength of the patient, and the number and force of the muſcles ſurrounding the articulation. It has been ſaid, that, in reducing a luxation, there is occaſion for more addreſs than force; it would be true, obſerves Boyer, to ſay, that the union of both is neceſſary. Often ſix aſſiſtants accompliſh that which three cannot do, and nine or ten perform that which cannot be done by ſix.

With regard to the direction in which the extenſion ſhould be made, Boyer recommends it to be at firſt the ſame as that which the luxation has given the diſlocated bone. Suppoſe the head of the humerus to be luxated inwards, and forced into the foſſa ſubſcapularis, between the ſubſcapularis muſcle and the ſcapula: in this caſe, the elbow is not only moved out from the trunk, but even carried backwards. Now, if we were to commence the reduction, by pulling in the natural direction of the humerus, that is, directly outwards, the head of the bone would be preſſed againſt the foſſa ſubſcapularis, it would not eaſily ſlide along, the force would be ſpent in puſhing the ſcapula backwards, and the irritation would excite the contraction of the muſcles ſituated near the luxated head of the bone.

Extenſion, then, is generally to be made at firſt in the direction which the luxated bone has taken; but in proportion as the muſcles become elongated, and yield to the force acting on them, the bone is to be gradually brought back into its natural poſition. In this manner the head of the bone is diſengaged from the parts in which it has been placed, and is brought back to the cavity which it has left, by making it deſcribe the ſame courſe that it took in making its eſcape.

We are now to conſider what is termed *counter-extenſion.*

As Boyer has juſtly remarked, the beſt directed extenſion will be uſeleſs, if the bone with which the luxated one has been articulated, is not kept motionleſs by counter-extenſion, a force equal to the other, but made in a contrary direction. The counter-extending power, applied to the luxated bone itſelf, would be attended, in almoſt every caſe, with the double inconvenience of producing a ſpaſmodic contraction of the muſcles, and preventing the elongation of them neceſſary for reduction. Let us ſuppoſe, ſays Boyer, that in a luxation of the thigh, the counter-extending bandage were in the fold of the groin of the affected ſide, the conſequence would be, that the triceps and gracilis, which are in a ſtate of tenſion between the pelvis and thigh, would be puſhed inwards, and, conſequently, ſhortened, when their elongation is abſolutely neceſſary. Beſides, the compreſſion made on them would alſo increaſe their contraction. The counter-extending force ought, therefore, to be applied immediately above the luxated bone. Sometimes the counter-extenſion is made by aſſiſtants, who take hold of the bandage neceſſary for the purpoſe; ſometimes it is executed by faſtening the bandage to a fixed point. The latter mode, when practicable, is to be preferred. The counter-extenſion ſhould always be made in a perpendicular direction with reſpect to the ſurface of the luxated joint. In a luxation of the elbow, for inſtance, the counter-extenſion ſhould be made in a line parallel to the os humeri; and in a diſlocation of the thigh-bone, the counter-extenſion, applied to the pelvis, ſhould be made perpendicularly to the ſurface of the acetabulum. The ſame rule is to be obſerved with regard to the ſhoulder in luxations of the humerus.

In general, when the extenſion is ſufficient, coaptation is eaſily performed. In a luxation of the humerus, as the head of the bone is diſengaged, and the aſſiſtants have brought the bone into its natural direction, the ſurgeon is to ſeize the opportunity, and with one hand preſs on the ſuperior and inner part of the arm, whilſt, at the ſame time, he ſupports the elbow with the other, and thus conducts the head of the bone into the glenoid cavity.

It is an excellent maxim, whenever practicable, to uſe a diſlocated bone as a ſort of lever, in making the reduction. Thus, after the head of the humerus has been diſengaged by the extenſion, if, while preſſure is made at the upper and inner part of the arm, the elbow is depreſſed, the head of the bone moves upwards in proportion towards the glenoid cavity of the ſcapula. The recollection of this principle will materially aid in reducing diſlocations of the jaw, thigh-bone, &c. Common ſenſe points out, in almoſt every caſe, how and where the fulcrum ſhould be made.

Luxations of ginglimoidal articulations being ſeldom complete, the extenſion and counter-extenſion are generally made, in ſuch inſtances, only with a view of diminiſhing the friction of the ſurfaces of the joint, neceſſarily occaſioned by the oppoſite motions given them, with a view of replacing them in their natural ſituation.

When extraordinary difficulty is encountered in reducing a diſlocation, the ſurgeon ſhould endeavour to aſcertain the cauſe. Sometimes want of ſucceſs is owing to the inſufficiency of the means employed, in which circumſtance, we muſt either increaſe the extending power, or diminiſh the muſcular force of the patient.

The latter object may be fulfilled in various ways. Change of poſture often produces the effect. In Boyer's work inſtances are mentioned in which patients, while ſeated on a chair, and ſupporting themſelves with their feet againſt the ground, could not have their luxations reduced with the greateſt efforts; and yet afterwards had their diſlocations reduced with unexpected facility, on being laid horizontally on a long fixed table, where their muſcles were deprived of a centre of motion. In general, however, the benefits of poſture may, with more reaſon, be imputed to its relaxing the moſt powerful muſcles oppoſing the endeavours of the ſurgeon.

When every attempt, conducted on the foregoing principles, proves ineffectual, the patient is to be largely and repeatedly bled, be put into the warm bath, and confined to a very low diet. As ſoon as he appears to be conſiderably weakened by this plan, the diſlocation, which was previouſly irreducible, may frequently be reduced with the utmoſt eaſe. We do not coincide with Boyer, when he adviſes us to loſe twenty-four hours in lowering the patient, before renewing the attempts at reduction. On the contrary, ſo fully are we convinced of the difficulty of reduction, always proceeding from delay, that we earneſtly recommend the efforts to reduce the bone to be renewed immediately after the patient has been weakened by the firſt copious bleeding, and to be tried again as ſoon as he has been a certain time in the bath. The faintneſs and debility following ſuch means, afford the moſt favourable opportunity for reducing a diſlocation. The ſtate of intoxication, induced by ſpirits or opium, is alſo well known to facilitate the reduction of luxated bones, by incapacitating the muſcles to make reſiſtance, and putting them into a condition in which they yield and become elongated by a very moderate force. Thus Boyer, by himſelf, and at the firſt attempt, reduced a luxation of the arm of an intoxicated poſtillion, while the aſſiſtants were preparing the apparatus for the reduction. The plan of purpoſely intoxicating patients, whoſe diſlocations cannot be reduced by ordinary means, has even received the recommendations of ſome ſurgical authors.

But, perhaps, of all the plans propoſed for overcoming the reſiſtance of the muſcles to the reduction of diſlocations, fatiguing thoſe organs by long continued unremitting extenſion is, when combined with due attention to the choice of ſuch a poſition as will relax the moſt powerful ones, the moſt effectual that can be adopted. The ſtrongeſt muſcles may always be overcome by keeping up, for a certain time, even a very moderate degree of extenſion. The thing is not to remit or diſcontinue for a moment the operation of the extending power. This principle is ſaid to have been firſt applied to practice by Lebat, who, in a caſe where the levatores of the lower jaw were ſpaſmodically contracted, in a diſlocation of that bone, and would not allow the part to be brought down, introduced a ſmall ſtick between the teeth, and making uſe of it as a lever, oppoſed the action of the muſcles until they were incapable of further reſiſtance, and the reduction was accompliſhed. M. David is alſo ſtated to have derived ſimilar advantages from the ſame practice, in luxations of the thigh and arm.

When luxations have been left unreduced ſeveral days, the reduction frequently becomes exceedingly difficult, and ſometimes quite impracticable. The lacerated opening in the capſular ligament, after a time, becomes cloſed, and thus a material impediment to the reduction is occaſioned. When a diſlocation has exiſted for weeks and months, many circumſtances take place to prevent the poſſibility of reduction: the head of the bone acquires connections in its new and unnatural ſituation; the muſcles become incapable of ſufficient elongation again; and, what is worſe, the articular cavity ſuffers more or leſs obliteration. In the ginglimoidal joints, an anchyloſis is ſoon produced, and the reduction rendered impracticable. We have ſeen many attempts made with multiplied pullies to reduce old diſlocations. In a few inſtances, a degree of benefit was thought to have been the reſult; but in no inſtance was the ſucceſs complete. Theſe luxations, however, might have exiſted an unreaſonable length of time. It is difficult to pronounce exactly how long a diſlocation of the arm or thigh muſt have happened, to juſtify the abandonment of all attempts at reduction. The celebrated French ſurgeon Deſault ſucceeded by the prudent employment of force in reducing many caſes which had exiſted for ſeveral months; and ſuch facts call upon the practitioner not to give up at once every old diſlocation as paſt relief. A patient's means of ſubſiſtence, for himſelf and his family, will often entirely depend upon his luxation being reduced. In the ginglimoidal joints, as we have already obſerved, luxations ſooner become irreducible: according to Boyer, after twenty, or four-and-twenty days, they, in general, cannot be replaced, owing to an anchyloſis having occurred.

The ſurgeon knows, that a luxation is reduced by the limb having recovered its natural length, ſhape, and direction, and by its having regained the power of performing certain motions impoſſible during the diſlocation. For ſome time after the reduction the limb ſhould not be moved, except with the utmoſt caution: a recurrence of a diſlocated ſhoulder has been known to ariſe from carrying the hand inadvertently to the forehead, by a ſemicircular motion.

The ceſſation of pain has been conſidered as a ſign of the reduction being effected; but, as Boyer has juſtly remarked, by ceſſation, we are to underſtand a conſiderable diminution, rather than a total diſcontinuance of pain.

Laſtly; one of the moſt unequivocal and ſatisfactory indications of the reduction being accompliſhed, is the particular noiſe made by the head of the bone when it ſlips into the articular cavity again.

After a diſlocation has been reduced, the grand object that now preſents itſelf, is to keep the joint motionleſs, ſo as to hinder a relapſe, and give the torn ligaments an opportunity of growing together again. All motion of the limb is, therefore, to be prevented. As the humerus cannot be luxated, except when it is at ſome diſtance from the body, a return of its diſlocation will be effectually prevented by tying the elbow to the ſide of the body. The bandage employed for keeping the limb motionleſs, ſhould always be made to operate principally on the end of the bone moſt remote from the joint affected. Thus, after a luxation of the arm, when we apply to the elbow the means for keeping the bone in its place, we act on that point of the humerus the moſt diſtant from its articulation with the ſcapula, and the force thus applied to the extremity of the lever, acts with much more effect. The ſame rule ſhould be obſerved in the application of a bandage to the chin, after a luxation of the jaw. Indeed, in this laſt caſe, ſuch practice has been recommended by all ſurgical writers; but in diſlocations of the ſhoulder and hip, they ſeem to have forgot the utility of the principle, and have generally adviſed that moſt inert bandage termed the ſpica, which only acts on the centre of motion, and, conſequently, can have little or no effect in keeping the bone fixed.

When a luxation ariſes from an internal cauſe, ſuch as paralyſis of the muſcles, a looſeneſs of the ligaments, or general debility, the duty of the ſurgeon is to endeavour to obviate the cauſe by ſuitable remedies, as well as replace the bone. We confeſs, however, that we know of no medicine nor application that ſeems to be calculated to remove a lax ſtate of the ligaments.

Luxations, in general, are particularly liable to be accompanied by more or leſs contuſion of the ſoft parts; and they are ſometimes complicated with inflammation, rupture of blood-veſſels, injury of nerves, and even a fracture. The latter complication is not frequent, but when it does occur, the bone has always been luxated firſt, and afterwards broken by the violence. The paralyſis ariſing from a contuſion of the nerves is not an uncommon conſequence of diſlocation of the ſhoulder; and when we conſider the relation between the head of the humerus and the brachial plexus, the occurrence is by no means ſurpriſing.

Boyer obſerves, that when a luxated bone is not reduced, ſometimes it remains in the place into which it has been forced; but much more frequently it changes its ſituation, and is carried ſtill further from the cavity of the joint by the action of the muſcles. Thus, in luxations of the thigh upwards and outwards, the glutei muſcles continue to draw the head of the thigh-bone up along the dorſum of the ilium, until the limb is ſhortened as much as the parts will allow.

But, as the ſame ſurgeon has explained, whether the head of the luxated bone preſerves its firſt poſition, or takes another, it becomes flattened on that ſurface, by which it is in contact with a ſubjacent bone, while this laſt has a kind of depreſſion gradually made in it. In ſome inſtances the original cavity of the joint diminiſhes in depth, eſpecially when the head of the bone remains near its circumference. The muſcles, impeded in their action, loſe their conſiſtence, aſſume a ligamentous appearance, and even become attached to the ligaments by a depoſition of oſſeous matter, and, in this manner, a bony caſe is formed, which conſtitutes, with the diſplaced bone, a new articulation.

When a bone is not reduced, the limb remains deformed, and ſcarcely any uſe can be made of it for ſome months; but in time it approaches rather more to its natural direction, and when a new joint is formed, is yet capable of a conſiderable latitude of motion. In general, however, in conſequence of the motion of the limb being more or leſs obſtructed, the muſcles fall away, and the limb has a weak and leſs bulky appearance than that of its fellow. When a diſlocation in a child is left unreduced, this difference between the ſize of the luxated limb and that of the ſound one, becomes very remarkable as the patient grows up to the adult ſtate.

We ſhall now treat of particular diſlocations, and afterwards conclude with ſome obſervations on compound luxations.

Luxations of the lower Jaw-bone.—When the mouth is widely opened, the condyles of the lower jaw advance forwards upon the eminentiæ articulares, and in this ſtate may be made to ſlip under the zygomatic proceſſes by very ſlight cauſes. This bone is only liable to be luxated in this one direction, whether one or both condyles eſcape from the glenoid cavities of the temporal bones. Every luxation, except that forwards, is rendered impoſſible by the natural conformation of the parts. A diſlocation backwards is oppoſed by the oſſeous portion of the auditory canal; and luxations laterally, to the right or left, are prevented by the reſiſtance ariſing from the ſpinous proceſſes of the ſphenoid bone and the ligaments of the joint. But it muſt be confeſſed, that the principal ſtrength of the articulation of the lower jaw does not depend upon theſe ligaments; but rather on the muſcles, and the particular conformation of the bones. The very ſhape of the lower jaw at once informs us, that a blow on its ſides muſt be more likely to break it, by increaſing its curvature, than diſlocate it.

According to Boyer, luxations of the lower jaw cannot happen in very young infants, on account of the body and rami of this bone meeting at an obtuſe angle, and, conſequently, the condyles and necks having nearly the ſame direction as the reſt of the bone, ſo that a luxation cannot be cauſed by any poſſible depreſſion of the chin. Diſlocations of the jaw are ſeldom cauſed by external violence; almoſt always by exceſſive yawning, or laughing.

The condyles of the maxilla inferior, being thrown before the tranſverſe roots of the zygomatic proceſſes, compreſs the deep-ſeated temporal nerves, and thoſe going to the maſſeters. This fact affords a better explanation of the pains attending a luxation of the jaw, than the tenſion and elongation of the maſſeter and other muſcles.

Beſides great pain, a more inſtructive ſymptom of this accident is the mouth being much open, and incapable of being ſhut. Theſe circumſtances are more evident in recent than old luxations of the jaw. An empty ſpace may be felt before the ears in the natural ſituation of the condyles. The coronoid proceſs forms under the cheek bone an eminence, which is perceptible through the cheek, or by introducing a finger into the mouth. The cheeks and temples are flattened by the lengthening of the temporal, maſſeter, and buccinator muſcles. The ſaliva flows in large quantities from the mouth, the ſecretion being augmented in conſequence of the exiſting irritation. The arch formed by the teeth of the lower jaw is placed anteriorly to that made by thoſe of the upper jaw. Laſtly; during the firſt days of the luxation, the patient can neither ſpeak nor ſwallow.

We have already adverted to one condyle being ſometimes diſlocated, while the other remains in its proper place. According to Mr. Hey, it is not always eaſy to know when this is the caſe. "One would expect," ſays this practical writer, "from a conſideration of the ſtructure of the parts, and from the deſcription given in ſyſtems of ſurgery, that the chin ſhould be evidently turned towards the oppoſite ſide; but I have repeatedly ſeen the diſeaſe, when I could diſcern no alteration in the poſition of the chin. The ſymptom which I have found to be the beſt guide in this caſe, is a ſmall hollow, which may be felt juſt behind the condyle that is diſlocated, which does not ſubſiſt on the ſound ſide." Pract. Obſerv. in Surgery, p. 325, edit. 2.

When the luxation is recent, the above ſymptoms enable us to aſcertain the nature of the accident with ſufficient eaſe; but when the diſlocation has exiſted ſeveral days or weeks, the caſe becomes leſs ſtrongly marked. The lower jaw has inſenſibly approached the upper one; and the patient gradually recovers the faculty of ſpeech and deglutition; but he ſtill ſtammers, and drivels.

Hippocrates pronounced luxations of the jaw to be fatal, unleſs reduced before the tenth day; but ſurgeons have now found, that this ſentiment is not well founded, and it is even ſuſpected, that Hippocrates might confound caſes of locked jaw with thoſe of diſlocations.

When the jaw has once been diſlocated, the accident is more prone to be produced again by ſlight cauſes. Mr. Hey mentions his having known two perſons in whom this diſlocation frequently happened. Not only yawning, but even opening the mouth incautiouſly in eating, would cauſe the accident. P. 326, edit. 2.

When a luxation of the jaw is to be reduced, the patient ſhould ſit on a low ſtool, with his head reſting on the breaſt of an aſſiſtant. In this poſition of the patient, the ſurgeon's hands are on a level with the mouth, which is advantageous, becauſe he is not obliged to elevate them, and conſequently can act with greater force on the jaw. The ſurgeon, after guarding his thumbs with linen, or a thick pair of gloves, is to introduce them into the mouth, and place them as far back as poſſible, on the great molares, at the ſame time bending under the chin the four fingers of each hand. The jaw, being thus graſped, is to be moved in the manner of a lever, the grinders being puſhed downwards and the chin upwards. No ſooner are the condyles thus extricated from under the zygomatic proceſſes, than the muſcles draw them up into their proper places again, with conſiderable force and ſuddenneſs. This takes place ſo rapidly, that the ſurgeon's thumbs would be in danger of injury, if he were to neglect to move them quickly outwards, and place them between the cheek and the jaws.

After the reduction, the four-tailed bandage for the lower jaw is to be applied, as in caſes in which this bone is broken. (See *Plate* V.) In the plate juſt referred to, however, it is proper to mention, that the centre of the bandage ſhould have been placed exactly on the chin, an eſſential circumſtance, as this is the point fartheſt from the centre of motion, and conſequently that where the bandage can operate with the moſt power in keeping the bone motionleſs. During the firſt days, the patient ſhould only be allowed liquid food, or ſuch as requires no maſtication.

When unuſual difficulty occurs in diſengaging the condyles from under the zygomatic proceſſes, owing to the reſiſtance of the muſcles, Le Cat's plan for overcoming and fatiguing theſe powers may be purſued; it conſiſted in introducing a ſmall ſtick between the teeth, and uſing it as a lever for combating the action of the muſcles, until they were quite exhauſted. Here the ſurgeon is not required to uſe violence, which might break the teeth, but only to keep up a moderate and unremitting extenſion of the reſiſting muſcles.

According to Mr. Hey, if both ſides of the lower jaw are depreſſed, while one ſide only is diſlocated, the reduction of the luxated condyle is rather prevented. The force ſhould be applied to the affected ſide alone. See Pract. Obſerv. in Surgery, p. 326, edit. 2.

Luxations of the Vertebræ.—The large ſurfaces by which theſe bones touch each other; the number and thickneſs of their ligaments; the ſtrength of the muſcles lying on the column formed by them; the ſmall motion of which each vertebra is capable; and, laſtly, the vertical direction of their articulating proceſſes (ſays Boyer), render a luxation of them in the dorſal and lumbar part of the column entirely impoſſible. A violence, though ever ſo conſiderable, cannot diſplace them, without firſt fracturing them. But this is not the caſe with the cervical vertebræ; the extent of their articulating ſurfaces is leſs; the ligamento-cartilaginous ſubſtance which unites their bodies has more pliability; the motion of their articulations is greater; and their articulating ſurfaces have an oblique direction, which allows them to have an obſcure rotatory motion. Hence luxations of the cervical vertebræ ſometimes preſent themſelves in practice. Boyer has ſeen a luxation of the middle cervical vertebræ cauſed by a violent rotatory motion of theſe bones.

Luxations of the Head from the firſt Vertebra.—The joints between the occipital bone and firſt vertebra of the neck, or atlas, are ſtrengthened with numerous ligaments, and only admit of very limited motion. We have no inſtance of luxation of the head from the firſt vertebra by an external cauſe, and ſuch a diſlocation, were it ever to happen, would inſtantly deſtroy the patient, by compreſſing and injuring the ſpinal marrow. But, as Boyer has remarked, nature, which cannot bear ſo ſudden a change, is habituated to it, when it takes place gradually, and the ſpinal marrow which would be fatally hurt by a ſudden diſlocation of the head from the atlas, is capable of bearing the ſame kind of luxation that is inſenſibly and ſlowly produced by diſeaſe.

Luxations of the firſt cervical Vertebra from the Second.—The motion of the head to the right and left is principally executed by the firſt vertebra turning on the ſecond. The laxity and weakneſs of the ligaments between theſe bones, and the direction of their articular proceſſes, tend to facilitate this kind of rotation, which motion, indeed, would frequently be carried beyond due bounds, and a diſlocation happen every time that we turn our heads, were not the motion confined by the very thick ligaments which go from the ſides and ſummit of the proceſſus dentatus of the ſecond vertebra to the edges of the great occipital hole. As Boyer obſerves, when this motion is forced beyond its proper limits, the ligaments are torn, and the lateral parts of the body of the firſt vertebra glide along on the articulating horizontal proceſſes of the ſecond. If the head is turned from the left to the right, the left ſide of the body of the vertebra is carried before its correſponding articulating ſurface, whilſt the right ſide falls behind its correſponding ſurface. In this luxation, ſometimes the proceſſus dentatus, the ligaments of which are broken, leaves the ring, formed for it by the tranſverſe ligament and the anterior arch of the firſt vertebra, and preſſes on the ſpinal marrow. In other examples, it does not quit the ring; but the diameter of the vertebral canal is always diminiſhed at the place of the diſlocation, and the ſpinal marrow injured or lacerated. It is readily conceivable, that the patient cannot ſurvive an accident of this nature, every wound of the ſpinal marrow, in ſo high a ſituation, being quickly fatal.

The celebrated M. Louis found, that the criminals who were in his time hanged at Lyons, periſhed by the luxation of the firſt vertebra from the ſecond; whilſt thoſe hanged at Paris were ſuffocated by ſtrangulation. He diſcovered that the cauſe of this difference was owing to a rotatory motion which was given to the body of the culprit by the executioner at Lyons, the moment it was ſuſpended. J. L. Petit mentions an inſtance in which a boy, between ſix and ſeven years of age, was killed in an inſtant by a luxation of the firſt from the ſecond vertebra, brought on by the boy ſtruggling, whilſt a perſon was raſhly lifting him up by the head. This laſt trick cannot be too ſeverely condemned as a moſt dangerous experiment.

There are other luxations of the neck not followed by death; but in theſe caſes, the diſlocation takes place in the third, fourth, fifth, or ſixth vertebra, and only one articulating proceſs is luxated. Some examples are quoted by Boyer, which were conſidered as caſes of this laſt deſcription, being attended with a diſtortion of the head to the right or left, without any ſpaſm or rigidity of the ſterno-cleido-maſtoideus muſcle.

When luxations of the cervical vertebræ produce no ſymptoms indicating a dangerous degree of preſſure on the ſpinal marrow, it is prudent not to attempt the reduction, as the patient may be killed in a moment by the endeavour, in conſequence of the ſpinal marrow becoming ſuddenly compreſſed and injured. If the ſymptoms, however, make it probable that the patient's only chance of life depends on altering the poſition of the luxated bones, the ſurgeon ought cautiouſly to attempt the reduction. Fortunately, theſe caſes are as unfrequent as they are perplexing, and we ſhall omit, as unintereſting to the practical ſurgeon, the uſual directions reſpecting the mode of reducing ſuch accidents. It is enough for the ſurgeon to be duly aware of the peril that accompanies the attempt.

Luxations of the Bones of the Pelvis.—Theſe bones are ſcarcely ſuſceptible of luxations. The os ſacrum, firmly fixed between the two oſſa innominata, cannot poſſibly be diſlocated. The os coccygis is more eaſily fractured than luxated. The latter accident, however, has ſometimes been obſerved. Boyer has ſeen it induced by ſloughing and diſeaſe, which denuded the bone, and evinced that there was a ſpace of nearly two inches between the extremity of the ſacrum and the baſe of the os coccygis. But, in the end, the two bones grew together again. Much has been written by authors concerning a relaxation and yielding of the ſymphyſis pubis and ſacro-iliac articulations in the advanced ſtages of pregnancy. We leave to the accoucheur the determination of this matter, as it is only indirectly connected with the ſubject of luxations.

When we ſtated that the bones of the pelvis were hardly ſuſceptible of luxations, our meaning was of courſe confined to the effect of ordinary cauſes. Great external violence, acting directly on any part, will make every thing yield. Thus, in the fourth volume of the Memoirs of the French Academy of Surgery, an inſtance is recorded, where the right os ilium was diſlocated from the ſacrum, three inches backwards, by a ſack of wheat, weighing three hundred and fifty pounds, falling on the back of a labourer. The patient died on the twentieth day, and the luxation was proved by diſſection. The pelvic viſcera were found in a ſtate of inflammation, with matter in the lower region of the abdomen.

Were a ſimilar accident to preſent itſelf to the practitioner, he ought to have recourſe to antiphlogiſtic means; for the danger chiefly depends on the pelvic viſcera becoming inflamed. Copious and repeated bleedings, the warm-bath, fomentations, and low diet, would be particularly indicated.

Luxations of the Ribs.—The ancient writers on ſurgery have furniſhed us with no obſervations concerning diſlocations of the ribs, and obſervers, who have publiſhed numerous facts relative to other caſes, make no mention of theſe accidents. Even J. L. Petit and Duverney, authors of more recent date, are ſilent on the ſubject; and as Paré, long before them, had diſtinctly treated of luxations of the ribs, we muſt aſcribe their ſilence to their diſbelief in the poſſibility of ſuch caſes.

Whether the ribs are ſuſceptible of diſlocation or not, is yet an unſettled queſtion.

Ambroſe Paré, Barbette, Junker, Platner, and Heiſter, deſcribe the accident as poſſible. Platner has obſerved: "Coſtæ longè frequentius franguntur, quàm à ſuâ ſede moventur. Non poſſunt in exteriorem partem excidere, cum oppoſiti proceſſus tranſverſi vertebrarum ſummam illarum partem contineant, nec facile ſurſum vel deorſum verſus promoveri poſſunt. Igitur ſi moventur in interiorem partem propelluntur.." Inſtit. Chir. § 1149. Platner actually enters into a detail of the ſymptoms to be apprehended in ſuch caſe: "cùm pleura prematur, gravis inflammatio et ſpirandi difficultas ſequitur." In a memoir inſerted amongſt thoſe of the Royal Academy of Surgery in France, M. Buttet is yet more poſitive than Platner, in only admitting the luxation forwards; but he does not conceive that the accident can happen to all the ribs with equal facility. The upper ones are protected by the ſcapula, and the lower, which are unfixed and very moveable, can only be luxated with great difficulty. He thinks that diſlocations can hardly occur to any of theſe bones, except the four or five lower true ribs, and two or three of the upper falſe ones, which laſt are more ſuſceptible of diſplacement, in conſequence of not being ſupported by the ſternum. On the other hand, Boyer, a late writer on diſlocations, is very poſitive that the ribs are exempt from theſe accidents. He tells us, that he ſhould have obſerved the ſame ſilence on the ſubject as J. L. Petit, did not a caſe, publiſhed in the Memoirs of the Academy of Surgery, after the death of that celebrated practitioner, ſeem to eſtabliſh the poſſibility of ſuch caſes. But Boyer contends, that, in reading this example, it is obvious the ſurgeon has miſtaken a fracture of the poſterior end of the ribs for a diſlocation. If, ſays Boyer, we attend to the number and force of the ligaments, which attach the ribs to the vertebræ and ſternum, and alſo to the manner in which the intercoſtal muſcles confine them, we ſhall not eaſily conceive how external violence, whether it acts on their middle or extremities, can luxate them. They are ſo firmly attached to the ſurrounding parts, that it is very difficult to ſeparate them from the body in the dead ſubject; and, in preparing ſkeletons, we often break thoſe bones, if we are not careful to cut all their bonds of union, before we attempt to detach them from the parts with which they are articulated. All the ſymptoms accompanying M. Buttet's caſe indicate a fracture of the neck, or poſterior extremity of the rib, as the pain, crepitation, and motion of the bone. No concluſion could be drawn from the motion, in proof of a luxation, ſince the fracture (if it were ſuch) was ſituated very near the back end of the rib, and, of courſe, the whole length of the bone would ſeem to move at once.

Boyer excludes from conſideration caſes, called by Lieutaud and others diſlocations of the ribs, which, in fact, are only ſeparations of the ribs and dorſal vertebræ from each other, in conſequence of the deſtruction of their ligaments, &c. by diſeaſe.

Luxations of the Clavicle, or Collar-Bone.—Luxations of the clavicle are much leſs frequent than fractures; and it was eſtimated by Default that the latter accidents are to the former as ſix to one. As far as our own experience enables us to judge, diſlocations are even more uncommon than this calculation repreſents.

The clavicle, however, may be luxated either from the ſternum, or the acromion.

Luxations of the ſternal End.—The ſternal end of the clavicle may be diſlocated forwards, backwards, or upwards, but never downwards, in which laſt direction a luxation is prevented by the cartilage of the firſt rib. The diſlocation forwards is by far the moſt frequent, and may be cauſed by exceſſive motion of the ſcapulary end of the clavicle backwards. Luxations upwards and backwards are very rare. The former can only be occaſioned by the ſhoulder being puſhed violently forwards and downwards, which ſometimes happens in falls. The diſlocation backwards is the moſt unuſual caſe of all.

If the ſhoulder is puſhed violently backwards, the ſternal end of the clavicle is propelled forwards, tearing the capſule of the articulation, the anterior ligament, and the tendon of the ſterno-cleido-maſtoideus muſcle. Quitting the ſurface with which it is articulated, it ſlips in front of the upper part of the ſternum, and produces under the ſkin in this ſituation, a hard prominence, which follows the motion of the ſhoulder.

When the ſhoulder is ſuddenly depreſſed, the ſternal end of the clavicle is eaſily luxated upwards, as there is nothing to limit its motion in this direction, except the inter-clavicular ligament, which, being relaxed by the greater contiguity of the two bones, is not capable of making effectual reſiſtance.

In the luxation backwards, the extremity of the clavicle is carried behind the ſuperior part of the ſternum.

The ſuperficial ſituation of the clavicle renders eaſy the diagnoſis of all luxations of its ſternal end. When the diſlocation happens forwards, a hard projection is felt, or even ſeen on the anterior and ſuperior part of the ſternum. Such projection may be made to diſappear by carrying the ſhoulder forwards and outwards. In the place which the head of the clavicle ought to occupy, an empty ſpace is perceptible.

In the luxation upwards, the diſtance between the ſternal ends of the two clavicles is leſſened.

If the luxation is backwards, the head of the bone forms a tumour at the interior and inferior part of the neck, and a depreſſion may be felt in the place which it ought to occupy. The head of the bone thus diſplaced, may, as Monſieur J. L. Petit has obſerved, compreſs the trachea, œſophagus, jugular vein, carotid artery, par vagum, &c. ſo as to cauſe dangerous ſymptoms. It is alſo to be noticed, that, in diſlocations of the ſternal and of the clavicle backwards, the head is inclined towards the affected ſhoulder.

Luxations of the ſternal extremity of the clavicle may be reduced by making a lever of the arm, by means of which the ſhoulder is firſt to be brought outwards, and then puſhed forwards, ſuppoſing the diſlocation to have happened in that direction. But if the luxation is backwards, the ſhoulder, after being drawn outwards, muſt be carried backwards; or upwards, when the diſlocation is in the ſame direction. By obſerving theſe rules, the head of the bone may be replaced, with the aid of a little preſſure of the thumb. But though the reduction may be eaſy, it is difficult to maintain it, all the ligaments being torn, and the articular ſurfaces diſpoſed to ſlide away from each other, on the ſlighteſt motion of the ſhoulder.

The apparatus uſed by Deſault for fractures of the clavicle is to be employed in luxations of the ſternal end of the bone. (See *Fractures of the Clavicle*, and *Surgical Plate* IV.) The ſhoulder continues to be kept outwards by means of the cuſhion placed in the axilla; but notwithſtanding the utmoſt attention on the part of the ſurgeon, the head of the clavicle cannot be prevented from being ſomewhat more prominent than that of the oppoſite ſide. Braſdon propoſed a tourniquet for making preſſure on the luxated extremity of the bone, with a view of hindering ſuch deformity, though, according to Boyer, it will not anſwer the purpoſe.

Luxations of the Scapulary End of the Clavicle.—Theſe caſes are much leſs frequent than the former, owing to the very great ſtrength of the ligaments binding the clavicle to the ſcapula. The ſcapulary end of the clavicle is ſeldom luxated in any direction except upwards. Boyer admits the poſſibility of the accident taking place downwards, and we think we have ſeen an inſtance, in which it was cauſed by a heavy brick falling on the ſhoulder from a conſiderable height. There was no crepitus, and the end of the bone, which was moveable, was obviouſly depreſſed below the acromion.

The diſlocation upwards is that, which principally demands the attention of the practitioner. It may be cauſed by falls, in which the violence operates on the extremity of the ſhoulder. The ſcapulary end of the bone ſlips upwards over the acromion, which laſt proceſs is itſelf a little drawn under the luxated part of the clavicle, when the ſhoulder is pulled inwards by ſuch muſcles, as have the effect of bringing the arm towards the trunk. The writer of this article was lately conſulted in a very manifeſt caſe of diſlocation of the ſcapulary end of the clavicle. The patient was a young gentleman out of Yorkſhire, where the accident had happened, and, not being underſtood, was left unreduced. When the caſe was brought to us, it was too late for any aſſiſtance to be rendered. Fortunately, the inconveniences ſuffered were not very great. The patient generally inclined his head towards the affected ſhoulder, and experienced a degree of weakneſs in raiſing his arm to his head; but even theſe infirmities were gradually becoming leſs.

Boyer conceives, that a violent action of the trapezius muſcle, which we know is attached to the outer half of the clavicle, may have a ſhare in producing this kind of diſlocation, eſpecially if the muſcle ſhould forcibly contract juſt at the moment when the acromion is fixed on the ground or body, againſt which it falls.

The diagnoſis of the accident cannot be very difficult, ſince the end of the clavicle may always be diſtinctly felt, forming a projection under the ſkin that covers the acromion. The head is inclined to the affected ſide, and the patient avoids moving the arm, in conſequence of ſuch action occaſioning pain.

The diſlocation is to be reduced by drawing the arm and ſhoulder outwards, and puſhing the diſplaced end of the clavicle downwards. Deſault's apparatus for broken collar bones is then to be applied. (See *Fracture of the Clavicle*, and *Plate* IV.) The cuſhion in the arm-pit, when the elbow is confined near the ſide with the roller, here acts very uſefully in keeping the ſhoulder outwards. The turns of the bandage, which go from the elbow to the ſhoulder, ſhould alſo be made to act eſpecially on the outer end of the clavicle, ſo as to preſs it downwards.

Luxations of the Shoulder; or of the Humerus, or Os Brachii, from the Scapula.—The ſhoulder joint allows the arm to be moved in every poſſible direction, and as the ſtructure, eſſential to ſo great a latitude of motion, hinders the articulation from being endued with the ſtrength and ſtability of other leſs moveable joints, it becomes, of courſe, a very pre-diſpoſing cauſe of diſlocations. In fact, no joint is ſo frequently luxated as the ſhoulder. And it appears from a comparative regiſter, kept at the Hôtel-Dieu at Paris, that, during ſeveral years diſlocations of this articulation equalled in number the luxations of all the other joints together. Œuvres de Deſault par Bichat, tom. i. p. 341.

Every thing, ſays the author of the preceding work, appears to facilitate the eſcape of the bone from its natural cavity. 1. In the articular ſurfaces, a ſhallow oval cavity, which receives a ſemi-ſpherical head twice as extenſive as itſelf in the perpendicular direction and thrice as broad from before backwards. 2. The only ligament, ſtrengthening this joint, is a mere capſule, which is thin below, the very direction in which there is nothing to oppoſe a luxation, and thicker above, where the acromion and coracoid proceſſes, together with the triangular ligament, form an almoſt inſurmountable obſtacle to ſuch an accident. 3. With reſpect to the muſcles and motions of the ſhoulder, we have to notice numerous and ſtrong faſciculi around the joint, communicating to it movements eaſily performed in every direction; propelling the head of the humerus againſt different points of the capſule; and rupturing the latter part, when their power is ſuperior to its reſiſtance. 4. As for external force, what bone is more expoſed to its effects, particularly in the labouring claſſes of ſociety?

Affected by ſo many different pre-diſpoſing cauſes, the humerus would be inceſſantly ſubjected to diſlocations, did not the ſcapula, which is equally moveable, follow all its motions, and afford it a point of ſupport differently diſpoſed, according to the different poſition of its upper end. In ſhort, much of the ſtrength of the joint depends upon the double moveableneſs of the two articular ſurfaces.

Of the different Kinds of Luxations of the Shoulder.—Though this joint is generally much diſpoſed to luxations, it is not equally ſo at every point. There are ſome points at which the accident cannot happen at all; while there are others at which, though it ſeems poſſible, it has never been obſerved. Hence, before examining the mechaniſm of diſlocations of the ſhoulder, Deſault endeavours to determine with preciſion the directions in which the accident is poſſible. He adverts to the confuſion exiſting among writers on this ſubject; ſome of whom employ different terms to expreſs the ſame thing; while others have affixed ſimilar names to things which are eſſentially different and diſtinct from each other. With regard to ſome kinds of luxations they all coincide; concerning others, they diſagree! Deſault firſt divides luxations of the humerus into two kinds; *viz. primitive*, which are the ſudden effect of external violence, and *conſecutive*, which ſucceed the former from cauſes hereafter to be explained.

The ſame eminent ſurgeon then directs us to ſuppoſe the oval ſurface of the glenoid cavity to have four ſtraight lines drawn at its ſides, in the form of a parallelogram; one repreſenting the upper edge of that cavity; another, the inferior; a third, the internal; and a fourth, the external.

It is manifeſt, that the head of the humerus cannot be diſplaced towards the upper edge of the glenoid cavity. In that direction the acromion and coracoid proceſſes, the triangular ligament ſtretched between them, the tendons of the biceps and ſupra-ſpinatus, and the fleſhy part of the deltoid muſcle, form an effectual reſiſtance to any force propelling upwards the head of the bone. Suppoſing a luxation in this direction were to happen, the head of the bone muſt alſo be puſhed outwards, a thing which is impoſſible, becauſe the trunk hinders the elbow from being inclined far enough inwards for that purpoſe.

On the other hand, the three remaining edges preſent but little reſiſtance. At the lower one, the long portion of the triceps; at the internal one, the tendon of the ſubſcapularis; and at the external, the tendons of the infra-ſpinatus and teres minor; eaſily yield to a force directed againſt them, and admit of primitive luxations taking place, either downwards, inwards, or outwards; downwards, between the tendon of the ſub-ſcapularis and that of the long head of the triceps; inwards, between the ſub-ſcapulary muſcle and foſſa; and outwards, between the infra-ſpinatus muſcle and ſubjacent part of the ſcapula. All theſe modes of diſplacement do not occur with equal frequency, as will be preſently conſidered.

After the head of the humerus has quitted the glenoid cavity, and ſlipped in one of theſe three directions, it often changes its ſituation again; and, in this event, a conſecutive luxation may follow a primitive one, either downwards, or inwards; but never that outwards, were ſuch a caſe to occur, becauſe the ſpine of the ſcapula would prevent it.

According to Deſault, a conſecutive luxation inwards may ſucceed a primitive one downwards, as there is nothing to hinder the head of the bone from paſſing between the ſubſcapulary muſcle and foſſa. On the contrary, ſhould it tend outwards, the tendon of the triceps reſiſts, and, notwithſtanding the ſtatement of Petit, a conſecutive luxation in this laſt direction never happens.

Sometimes, when the head of the humerus has eſcaped at the internal or inferior part of the capſule, it is carried behind the clavicle, ſo as to form a conſecutive luxation upwards, a caſe which was noticed by Paré, perhaps by Galen, and a ſpecimen of which was preſerved in Deſault's muſeum. Here the ſeccondary diſplacement only takes place ſlowly, and after it has happened, art can ſeldom correct it, on account of the firm adheſions contracted by the ſurfaces of the bone. Thus, in the example referred to, a new cavity was formed behind the clavicle, and the humerus was connected with the ſurrounding part by a kind of new ligaments.

From this ſtatement, derived from Deſault, it follows that the humerus is ſubject to four ſorts of diſplacement: 1, downwards; 2, outwards. In theſe directions the diſlocation is always primitive. 3. Inwards, which may be either primitive or conſecutive. 4. Upwards, in which direction the accident can only happen conſecutively. As Deſault obſerves, the ſecond and the fourth caſes are exceedingly rare, compared with the reſt.

Primitive Luxations.—Theſe are cauſed by falls or blows on the arm, and the kind of diſlocation appears to be determined by the poſition in which the limb happens to be at the moment of the accident.

If the arm is more or leſs raiſed from the trunk, without being inclined either forwards or backwards, and the patient falls laterally, the weight of the body, being almoſt entirely ſupported by the humerus, forces downwards its upper end, which lacerates the capſular ligaments, and is diſlocated downwards. The occurrence is alſo in part facilitated by the united action of the latiſſimus dorſi, pectoralis major, and teres major muſcles. Theſe are in a ſtate of involuntary action, and tend to draw downwards the head of the humerus, while the elbow remains fixed on the ground or ſurface againſt which it has fallen. Some authors believe, that a violent contraction of the deltoid muſcle may alſo have a ſhare in luxating the ſhoulder downwards, as it may tend to force the head of the humerus through the capſular ligament towards the axilla. Deſault thinks the truth of this ſtatement is confirmed by many obſervations, and quotes the caſe of a notary whoſe ſhoulder was diſlocated downwards, in lifting up a heavy regiſter book.

The manner in which a primitive luxation inwards is produced, is little different from that of the foregoing caſe. The elbow, at the moment of the fall or blow, is both ſeparated from the trunk and carried backwards. The weight of the body acts upon the humerus, the anterior portion of the capſular ligament gives way, and the head of the bone is diſlocated forwards.

The luxation outwards can only be occaſioned when the elbow is inclined forwards, towards the oppoſite ſhoulder. If the force is ſufficiently great, the outer part of the capſular ligament is lacerated, and the head of the humerus diſplaced. But, ſays Deſault, what can ſuch power be? In a fall, when the arm is forced againſt the ſide, it cannot be moved far enough to cauſe a laceration of the capſule. Hence this eminent ſurgeon concluded, that luxations of the head of the humerus outwards muſt be very uncommon caſes. None are recorded by ſurgical writers, and Deſault himſelf had never obſerved ſuch an accident. Beſides, it is worthy of attention, that when in falls, the arm ſeparated from the ſide is inclined either forwards or backwards, the weight of the body only operates upon it obliquely, and it is little acted upon by the latiſſimus dorſi, pectoralis major, and teres major muſcles. Hence no diſlocations of the ſhoulder are ſo frequent as thoſe downwards, in the production of which caſes the influence of the weight of the body, and of the action of the muſcles is direct. However, the luxation inwards is not uncommon, and many of Deſault's caſes prove the poſſibility of a primitive diſlocation of this kind, notwithſtanding ſeveral modern authors have doubted it, by believing with Hippocrates, that originally all luxations of the ſhoulder happen downwards.

It ſometimes happens, that the lacerated opening in the capſular ligament ſuffices for the paſſage of the head of the bone from the glenoid cavity, but immediately afterwards contracting, is not large enough to admit of its return. This practical fact was firſt noticed by Deſault, who has publiſhed two examples of it in his journal. Such caſes have ſince been very frequent at the Hôtel Dieu, at Paris.

Conſecutive Luxations.—When a conſecutive luxation ſucceeds a primitive one, many cauſes may concur in producing this change. If a ſecond fall ſhould happen, the elbow being ſeparated from the ſide, the head of the bone may eaſily be forced out of the place into which it was firſt thrown. A caſe illuſtrating this obſervation is related in Les Œuvres Chir. de Deſault par Bichat, tom. i. p. 350.

The action of the muſcles is a permanent cauſe of a freſh diſplacement. When the humerus is diſlocated downwards, the pectoralis major, and the inner portion of the deltoid, pull its upper portion inwards and upwards.

Various movements communicated to the arm may alſo produce a change in the poſition of the luxated head of the bone, according to their direction. Thus a luxation inwards has frequently ſucceeded one downwards, in conſequence of awkward efforts to reduce the bone.

Symptoms of Luxations of the Shoulder.—In general, the diagnoſis of luxations of the ſhoulder is not attended with much difficulty. As Hippocrates has obſerved, whatever may be the mode and ſituation of the diſplacement, a manifeſt depreſſion may always be perceived under the acromion, which proceſs ſeems to project more than in the natural ſtate. Moving the humerus is very painful, and indeed moſt of its motions are either impeded, or very much limited. The arm cannot be moved without the ſhoulder being alſo moved, becauſe, the functions of the joint being prevented, both theſe parts form as it were only one.

To ſuch ſymptoms, common to all diſlocations of the ſhoulder, are to be added thoſe which belong to particular caſes. If the luxation is downwards, the arm is ſomewhat longer than in the natural ſtate; it may be moved a little way outwards; but every attempt to carry it forwards or backwards inevitably occaſions acute pain. The elbow is more or leſs raiſed from the axis of the body by the action of the deltoid, the long portion of the biceps, and the ſupraſpinatus muſcles, which, being on the ſtretch, contract and incline the bone outwards. In order to avoid the pain ariſing from this poſition, the patient leans towards the affected ſide, keeps his fore-arm half-bent, and reſts his elbow on his hip, ſo that the arm may have a fixed point to hinder all painful motions of the limb. By this attitude alone, Deſault was accuſtomed to recognize a luxation downwards, and he was ſeldom deceived. Beſides theſe circumſtances, we have to mention, that the diſlocated head of the bone always produces a hard and more or leſs evident prominence in the hollow of the axilla.

In addition to the ſymptoms common to all luxations of the ſhoulder, the diſlocation inwards preſents the following: the elbow is ſeparated from the ſide, and carried a little backwards; the humerus appears to be directed towards the middle of the clavicle; moving the limb backwards is not very painful, but carrying it forwards is exquiſitely ſo; a manifeſt prominence may be noticed under the pectoral muſcle; the arm is ſcarcely longer than in the natural ſtate; and the patient's attitude reſembles that of the foregoing caſe.

Were a diſlocation outwards ever to happen, it would be particularly characterized by a hard tumour under the ſpine of the ſcapula, by the inclination of the elbow forwards, and its ſeparation from the ſide; and, laſtly, by the length of the limb appearing a little increaſed.

A luxation upwards would be announced by a projection behind the clavicle, an obvious ſhortening of the arm, and its unnatural direction.

It is frequently much more eaſy to aſcertain the exiſtence, than the ſpecies, of luxation of the ſhoulder. Indeed, ſometimes it is a moſt difficult matter to determine, whether a diſlocation inwards is primitive or conſecutive, as the apparent phenomena of each caſe are alike. The judicious and experienced Deſault taught, that this intereſting point is only capable of being elucidated by attention to the hiſtory of the caſe, and the order in which the ſymptoms preſented themſelves. This excellent ſurgeon repreſents the diſtinction as of much practical importance, ſince the proper mode of reducing the two caſes is different, the head of the bone having to deſcribe a very ſhort track in the primitive luxation, and a more circuitous one in that which is conſecutive.

Diſlocations of the ſhoulder do not commonly give riſe to any accidental bad or troubleſome ſymptoms. Sometimes, immediately after the occurrence, the joint is affected with a great deal of ſwelling; but this complaint generally ſubſides very quickly, under the uſe of the aqua vegeto-mineralis.

In certain inſtances, the preſſure of the head of the bone on the axillary glands and veins produces an œdema of the whole limb. Deſault ſeldom obſerved this happen, except where the reduction had been delayed. The treatment he recommends is to apply a roller to the limb, after reducing the head of the bone.

Another accident, which was ſeveral times obſerved by this diſtinguiſhed ſurgeon, is a paralyſis of the limb, occaſioned, in the luxation inwards, by the preſſure of the head of the bone on the axillary plexus of nerves. In ſome inſtances, this affection proved incurable; in others, it yielded to the employment of ſtrong ammoniacal liniments. A few obſtinate caſes were cured by making an iſſue juſt over the clavicle by means of the moxa; but this laſt method was as frequently unavailing as ſucceſsful.

Reduction of Luxations of the Shoulder.—The infinite variety of modes propoſed for reducing diſlocations of the ſhoulder may be referred to two general claſſes. Some conſiſt in replacing, by a mechanical force, the head of the humerus in the cavity from which it has eſcaped, whether previous extenſion be made or not. Others are reſtricted to diſengaging the head of the humerus from the ſituation which it accidentally occupies, and the reduction is left to be accompliſhed entirely by the action of the muſcles.

The hiſtory of all the methods intended to operate on the firſt principle would be tedious and unprofitable. Suffice it to ſtate, that almoſt all of them act in the following manner. Something being placed under the axilla, ſerves as a fulcrum, on which the arm is moved in the way of a lever, the reſiſtance being the luxated head of the humerus, and the power being applied either to the lower part of this bone or to the wriſt. It was in this manner that the ambi of Hippocrates acted, that machine ſo renowned even in modern times, and of which numerous modifications have been deviſed by Paulus Ægineta, Ambroſe Paré, Duverney, Freke, &c. By ſuch an apparatus, the head of the humerus was at once directed towards the glenoid cavity of the ſcapula, and diſengaged from its unnatural ſituation.

Extenſion of the arm uſually produces this ſecond effect, and has been accompliſhed in a variety of ways. Sometimes the weight of the body on one ſide, with the dragging of the diſlocated limb on the other, ſerved to make the extenſion. It was on this principle that the ladder, the door, and the ſtick operated, as deſcribed by Hippocrates in his treatiſe on fractures, and repeated by all ſubſequent writers. On other occaſions, the trunk has been immoveably fixed, while the arm was forcibly extended. This was the mode purſued in employing the machines deſcribed by Oribaſius.

Sometimes no perceptible extenſion at all was made, and the head of the humerus, being propelled outwards by ſomething put under the axilla, was puſhed by the ſurgeon at once into the glenoid cavity.

With Deſault, we ſhall abſtain from entering into a particular explanation of the objections to the preceding methods. Petit and B. Bell have already detailed their diſadvantages. Whoever conſiders that the head of the bone has eſcaped through the ruptured and lacerated capſular ligament, and that it is impoſſible to know preciſely the exact ſituation of the opening, muſt perceive how abſurd it is to attempt to direct the head of the bone to it by any artificial force.

However well covered with ſoft materials the body may be, which is put under the axilla for the purpoſe of ſerving as a fulcrum, an unpleaſant chaffing, or even dangerous degrees of ſtretching and laceration, may ariſe from its application, when the trunk is ſuſpended over it, as in the employment of the door, ſtick, &c. By ſuch practice, Petit ſaw the neck of the humerus fractured, and the axillary artery ruptured, ſo that an aneuriſm was the conſequence.

A wiſe objection, alſo made by Deſault to the uſe of any apparatus of the foregoing kinds, is, that few ſurgeons are provided with the inſtrument, and therefore much uſeful time would be loſt in procuring it, when the caſe is actually waiting for relief. Beſides, ſays he, when the luxation is conſecutive, how can any mechanical contrivances have the effect of drawing back the head of the bone through the track by which the diſplacement has taken place? For inſtance, if a luxation inwards has ſucceeded one downwards, the head of the bone ought to be drawn downwards before being replaced in its natural cavity. How can the direction of the extenſion be varied accordingly? It is likewiſe to be obſerved, that every apparatus alluded to reſiſts the action of the muſcles, which, in fact, ought to be the principal agent in the reduction. Were a luxation ever to happen upwards, no apparatus could anſwer, as muſt be moſt evident.

No doubt, however, when the head of the humerus is luxated downwards, and is not ſituated far from the glenoid cavity, the machines to which we have alluded will often ſerve to effect the reduction with tolerable facility. But in ſuch caſes, there is no real occaſion for artificial contrivances, as natural means will be found quite ſufficient. In ſhort, the reduction may be executed with the hands, and with this advantage, that the direction of the movements may be regulated and varied with more preciſion.

The following method was frequently purſued by Deſault with ſucceſs: the patient ſat on a chair of middling height: Deſault placed the hand of the luxated limb between his knees, which he moved backwards, ſo as to make extenſion, and diſengage the head of the bone, while an aſſiſtant held back the trunk, and made the requiſite counter-extenſion. Deſault now took hold of the upper part of the humerus with both his hands, and puſhed its head upwards and a little outwards into the glenoid cavity.

This mode is mentioned by Petit, though complicated with the employment of a napkin, which was put under the axilla, and over the ſurgeon's neck, who forced upwards the head of the bone by drawing back his head.

In recent luxations of the ſhoulder downwards, Deſault ſometimes often found even a more ſimple plan anſwer: he put his left hand in the axilla to ſerve as a fulcrum, while, with the right, which was applied to the lower and external part of the arm, he moved the humerus towards the trunk, at the ſame time puſhing the bone upwards. By this double movement, directed upwards and outwards, the head of the humerus is put into its natural ſituation. See Œuvres Chirurgicales de Deſault, par Bichat, tom. i. p. 363, 364.

Mr. Hey notices, that if the head of the os humeri remains in the axilla, and not far removed from the glenoid cavity, the reduction may ſometimes be executed with a very ſmall degree of extenſion. Thus, in the relation of one caſe, he obſerves: "after I had put every thing in proper order for the reduction, I deſired the aſſiſtants, who were to make the extenſion, to keep the arm elevated at a right angle with the body, till I ſhould direct them to begin the extenſion. In doing this, they kept the arm a little upon the ſtretch, waiting for my orders. While the arm was in this ſtate, I placed my fingers below the head of the bone, that I might be ready to co-operate with them; and preſſing my fingers upwards into the axilla, that I might feel the head of the bone diſtinctly, the reduction was unexpectedly made by this gentle effort." Pract. Obſerv. in Surgery, p. 295—226, edit. 2.

The ſame experienced ſurgeon once ſaw a luxated ſhoulder reduced by the mere efforts of the patient, who, while preparation for the reduction was making, walked about in pain, and after placing his hand on the back of a chair, and moving his body in different directions, cried out, as if hurt more than uſual. He then ſat down, and ſaid that he was eaſy, and could move his arm better. In ſhort, the bone was actually reduced. P. 297. op. cit.

Reduction of Luxations of the Shoulder by Means of Extenſion, as practiſed by Deſault.—There muſt be an adequate number of aſſiſtants, in order to increaſe, according to neceſſity, the force which is to overcome the reſiſtance experienced; but, in general, two are quite ſufficient. A thick pad ſhould be procured, for the purpoſe of guarding the margins of the axilla from injury; and the aſſiſtants ſhould be furniſhed with a ſheet, doubled into folds, about four inches in breadth, and alſo with a towel folded in the ſame manner.

The patient is to ſit on a lowiſh chair, or he may be laid on a ſtrong immoveable table. Deſault long followed the firſt of theſe modes, according to ordinary cuſtom, though, as Bichat remarks, it is not in every reſpect the moſt advantageous. In the ſitting poſture, indeed, the arm may be very well extended tranſverſely; but if, as often happens, it is neceſſary to direct the extenſion upwards or outwards, the aſſiſtant, being then obliged to raiſe or lower himſelf, does not poſſeſs equal power in the new poſture, and finds himſelf embarraſſed, and incapable of varying the direction of the extenſion, according as the ſurgeon may think beſt.

As for the patient, he finds ſuch poſture, in which the trunk is only partly ſupported, much more irkſome than that in which the cheſt lies equally upon an horizontal ſurface. Motives of this kind induced Deſault, in the latter years of his practice, to renounce the ſitting poſition.

The patient's poſture being arranged, the linen pad is to be put under the axilla of the affected ſide, and the middle of the folded ſheet is to be placed on ſuch compreſs, while the two ends are to be carried obliquely before and behind the cheſt to the oppoſite ſhoulder, where, being held by an aſſiſtant, they ſerve to fix the trunk, and to make the counter-extenſion. The pad hinders the ſheet from preſſing on the margins of the pectoralis major and latiſſimus dorſi. Were it not ſo, theſe muſcles, being pulled upwards, would draw the humerus in the ſame direction, and defeat the extenſion, which is performed as follows.

Deſault made two aſſiſtants take hold of the fore-arm above the wriſt, or elſe he cauſed the folded towel to be applied to this part, and confided to the care of one or two aſſiſtants, who were to begin the extenſion in the ſame direction in which the diſlocated bone lies. This firſt movement, intended to diſengage the head of the humerus from the place in which it happened to be lodged, was followed by another, which varied according to the kind of luxation. When the diſlocation was downwards, Deſault gradually brought the arm near the ſide, at the ſame inſtant that he puſhed it gently upwards. By this artifice, the head of the bone was inclined towards the glenoid cavity, into which it generally entered without difficulty.

When the luxation was inwards, the humerus was brought upwards and forwards, after the firſt extenſion in the direction of the bone: thus its head was directed backwards. Were a luxation to occur outwards, it would be neceſſary to move the humerus, during the extenſion, exactly in a direction oppoſite to that recommended in the foregoing inſtance.

As ſoon as the head of the humerus has been diſengaged by the firſt extenſion, the movement communicated to the bone by the ſubſequent extenſion ought in general to be preciſely in the contrary direction to that in which the head of the bone has eſcaped.

When any difficulty ſeems to oppoſe the reduction, the bone ſhould be moved in different directions, after the requiſite extenſion has been made, with due attention to the principle juſt laid down. This method will frequently anſwer when ſimple extenſion will not, the head of the bone being conducted by the movements towards the glenoid cavity.

When the luxation was conſecutive, Deſault, by means of the firſt extenſion in the direction of the diſlocated bone, brought its head into the ſituation where it was originally lodged, and he then acted juſt as if the caſe were altogether a primitive one. Very often, whether the accident is of one kind or the other, can only be diſtinguiſhed at the time of the reduction. In fact, when the extenſion is well managed, the reduction moſtly happens ſpontaneouſly, and if the head of the bone is luxated inwards conſecutively, it may be obſerved deſcending along the inſide of the ſcapula, and then paſſing over the inferior part, and aſcending towards the laceration in the capſule.

It has been ſtated that when the extenſion is properly managed, the reduction is effected almoſt ſpontaneouſly. Whatever may be the kind of primitive luxation, it is evident that the muſcles ſurrounding the articulation are on one ſide ſtretched, and on the other relaxed. Hence a change in their contractions, and in the direction of thoſe contractions, is neceſſarily occaſioned. This alteration is ſuch, that if the muſcles act, inſtead of pulling the head of the bone towards the lacerated capſule, they drag it in quite a contrary direction, and thus produce a conſecutive luxation.

But it is very different, when, by means of extenſion, the direction of the action of the muſcles has been rectified. They now tend to pull the head of the bone towards the ruptured capſule, and indeed they do ſo with much more certainty than the ſurgeon, who is always ignorant of the preciſe ſituation of the opening in the capſule. On the other hand, when the extenſion is ill made, and the natural direction of the muſcles has not been reſtored, the head of the bone is forced againſt another part of the capſule; and hence the difficulty of reduction ſo frequently experienced.

It follows from the preceding obſervations, firſt; that the whole ſkill in the treatment of luxations is to make the extenſion in an advantageous direction. Secondly; that, in general, what has been termed coaptation is almoſt always uſeleſs. Thirdly; that the reduction of a luxation does not conſiſt in putting the head of the bone into its cavity again; but in placing the muſcles in a ſtate in which they are enabled to reduce the bone.

But it is not to be denied that there are caſes where the action of the muſcles being perverted, in conſequence of the long exiſtence of the diſlocation, and the formation of adheſions to the ſurrounding parts, it becomes neceſſary to reſort to means for forcing, as it were, the paſſage of the head of the bone into the glenoid cavity.

When the luxation has been reduced, the arm is to be kept motionleſs for a few days, leſt the head of the bone ſhould ſlip out of its place again. Surgeons have been accuſtomed to apply the ſpica bandage, though without the leaſt reaſon, as it does no good whatſoever, becauſe it has no effect in confining the limb. The proper practice is to keep the arm quiet, and cloſe to the ſide with a roller and ſling. Deſault himſelf employed the bandage deſcribed in the article FRACTURE. See *Fracture of the Clavicle.*

Method adopted by Engliſh Surgeons.—In this country, ſurgical practitioners always reduce diſlocations of the ſhoulder while the patient is in a ſitting poſture, and, inſtead of imitating the French, they adhere to the ancient mode of applying the extending force to the luxated bone itſelf, juſt above the elbow. No doubt, they have been more influenced in ſuch practice by the authority of Mr. Pott, than by any real advantage attending the method. According to the notions of this latter gentleman, "all the force uſed in reducing the luxated head of a bone, be it more or leſs, be it by hands, towels, ligatures, or machines, ought always to be applied to the other extremity of the ſaid bone, and as much as poſſible to that only." Another maxim laid down by Pott is, that in order to make uſe of an extending force with all poſſible advantage, and to excite thereby the leaſt pain and inconvenience, it is neceſſary that all parts, ſerving to the motion of the diſlocated joint, or in any degree connected with it, be put into ſuch a ſtate as to give the ſmalleſt poſſible degree of reſiſtance.

"This (ſays Mr. Pott) I take to be the firſt and great principle by which a ſurgeon ought to regulate his conduct in reducing luxations. This will ſhew us why a knowledge of all the muſcular and tendinous parts, acting upon or in connection with the articulations, is abſolutely neceſſary for him who would do his buſineſs ſcientifically, with ſatisfaction to himſelf, or with eaſe to his patient. It will ſhew us that the mere poſition of the limb below the luxated joint, is what muſt either relax or make tenſe the parts in connection with that joint, and, conſequently, that poſture is more than half the buſineſs. It will ſhew us why ſometimes the luxated os humeri ſlips in, as it were of its own accord, by merely changing the poſition of the arm, when very violent attempts, previous to this, have proved ſucceſsleſs. It will ſhew us why extending the arm in a ſtraight line, horizontally, or ſo as to make a right angle with the body, muſt in ſome inſtances render all moderate attempts fruitleſs. Why the method of attempting reduction by the heel in the axilla is ſo often ſucceſsful, notwithſtanding two very conſiderable diſadvantages under which it labours; *viz.* part of the force being *loſt in the elbow*, and the tenſe ſtate of one head of the biceps cubiti. Why the tying down the fore-arm in the common ambi is wrong for the ſame reaſons. Why the fore-arm ſhould at all times (let the method of reduction be what it may) be bent; *viz.* becauſe of the reſiſtance of the long head of the biceps in an extended poſture. Why, when the os humeri is luxated forward, or ſo that its head lies under the great pectoral muſcle, the carrying of the extended arm backward, ſo as to put that muſcle on the ſtretch, renders the reduction very difficult; and why, on the contrary, the bringing the arm forward, ſo as to relax the ſaid muſcle, removes that difficulty, and renders reduction eaſy, &c."

In our opinion, ſome of theſe obſervations do not ſhew the thing intended, quite as well as Mr. Pott ſeems to conceive. We do not ſee how *all* the parts, in connection with a joint, can be relaxed by poſture. We ſee, it is true, how bending the elbow relaxes the biceps, but then it puts the long head of the triceps on the ſtretch, which may alſo reſiſt the reduction. As for the extending force being *loſt* in the elbow, when applied below the diſlocated bone, we have endeavoured to prove the error of the ſuppoſition in our general remarks. With reſpect to the laſt part of the foregoing, we think the explanation given by Bichat, in his edition of Deſault's works, more correct, namely, that when the luxated head of the humerus lies forward under the pectoral muſcle, carrying the elbow forwards and inwards tends to throw the head of the bone backwards and outwards, and then the muſcles are enabled to act with effect in promoting the reduction.

To the truth of the enſuing remarks, delivered by Mr. Pott, we have pleaſure in aſſenting. That in the reduction of ſuch joints as conſiſt of a round head moving in an acetabulum, or ſocket, no attempt ought to be made for replacing the ſaid head, until it has by extenſion been brought forth from the place where it is, and nearly to a level with the ſaid ſocket. This will ſhew us why the old method by the door, or ladder, ſometimes produced a fracture of the neck of the ſcapula, Mr. Pott himſelf has ſeen happen. Why, if a ſufficient degree of extenſion be not made, the towel, over the ſurgeon's ſhoulder, and under the patient's axilla, muſt prove an impediment rather than an aſſiſtance, by thruſting the head of the humerus under the neck of the ſcapula, inſtead of directing it into its ſocket. Why the common method of bending the arm, that is, the os humeri, downward, before ſufficient extenſion has been made, prevents the very thing aimed at, by puſhing the head of the bone under the ſcapula, which the continuation of the extenſion, for a few ſeconds only, would have carried into its proper place. When the head of the os humeri is drawn forth from the axilla, and brought to a level with the cup of the ſcapula, it muſt be a very great and very unneceſſary addition of extending force, that will, or can keep it from going into it. All that the ſurgeon has to do, is to bring it to ſuch a level; the muſcles attached to the bone will do the reſt.

A very juſt and important maxim, inculcated by Mr. Pott, and indeed by every judicious ſurgical writer of recent date, is, that whatever kind or degree of force may be found neceſſary for the reduction of a luxated joint, ſuch force be employed gradually; that the leſſer degree be always firſt tried, and that it be increaſed *gradatim.* See Pott's Remarks on Fractures and Diſlocations, vol. i. of his works.

After adverting to a few impediments to the reduction of diſlocated ſhoulders, we may here (not abruptly we hope) take leave of the ſubject, without expatiating on the methods purſued in this country, becauſe in fact the practice of Deſault, as already related, differs from our's chiefly in the extenſion being made at the wriſt. If we ſuppoſe the elbow bent, and the extending force applied juſt above the joint, it will be eaſy to follow the directions already given, with regard to the manner of making the extenſion, and the time and mode of altering the poſition of the bone during the proceſs.

We ſhall conclude our account of diſlocations of the ſhoulder, with noticing ſome circumſtances which may tend to render the reduction difficult.

The firſt to which we ſhall requeſt the reader's attention, is the narrowneſs of the lacerated opening in the capſular ligament. The practice of Deſault, when he had reaſon to ſuſpect this kind of impediment, was to endeavour to dilate the aperture by moving the humerus very freely and forcibly in every direction, and puſhing its head at the ſame time towards the glenoid cavity.

The luxation not being recent, may be another cauſe hindering the reduction, and is ſometimes an inſurmountable obſtacle to ſucceſs. The luxated head of the bone, after a time, contracts adheſions; and the ſurrounding cellular ſubſtance becomes condenſed, and converted as it were into a new kind of capſular ligament, which confines the bone in its unnatural ſituation. Moſt ſurgical authors recommend us in ſuch a caſe to make no endeavour to put the bone into its place again, as the attempt would, in all probability, fail, and might bring on ſerious conſequences, by reaſon of the violence which muſt be exerted. Deſault once profeſſed the ſame doctrine, but in the latter part of his life experience led him to a bolder practice. After being completely ſucceſsful in reducing ſome luxations, which had exiſted from fifteen to twenty days, he was encouraged to attempt the reduction of others, which had happened from thirty to five and thirty days; and during the two years before his death, he had, in Bichat's preſence, replaced diſlocations of the ſhoulder after ten weeks, and even three months, when the head of the humerus had eſcaped either at the inferior, or internal part of the capſule. Notwithſtanding the long continued extenſions which were employed, there were none of the terrible conſequences induced, with which authors have intimidated the generality of practitioners. In two inſtances, a ſudden and unaccountable emphyſema of the ſhoulder took place, which yielded to the uſe of a bandage and the ſaturnine lotion. See Œuvres de Deſault par Bichat, tom. i. p. 377.

In caſes of this kind, before the extenſion is begun, the bone ſhould be freely moved about in every poſſible direction, in order, in the firſt inſtance, to break the adheſions, lacerate the condenſed cellular ſubſtance, that ſerves as the accidental capſule, and thus produce, as it were, a ſecond luxation for the purpoſe of curing the firſt. The means for extenſion are then to be applied as uſual, with an increaſed number of aſſiſtants. In theſe caſes we have ſeen the multiplied pulley uſed with advantage, though it is certainly a dangerous machine, unleſs in careful hands.

Frequently the firſt attempts are unavailing, and the luxated head of the bone continues immoveable, in the midſt of the moſt powerful efforts. The extenſion is then to be ſtopped, and the bone moved about again in all directions; every reſiſtance is to be broken; let the arm deſcribe a large ſegment of a circle in the place which it occupies; and let it be rotated on its axis. Then let extenſion be repeated in every direction.

For caſes proving the occaſional efficacy of ſuch practice, we muſt refer to Deſault's Œuvres Chirurg. par Bichat, tom. i. p. 375.

In this excellent work it is obſerved that, ſuppoſing the attempts to fail, they are not entirely uſeleſs; for, by moving the head of the bone ſomewhat towards the glenoid cavity, or even juſt before it, they give the limb a greater freedom of motion.

A third obſtacle to the reduction of all luxations ariſes from the power of the muſcles, which power is exerted with violence in conſequence of the manner in which theſe organs are ſtretched. Sometimes the reſiſtance of the muſcles, indeed, abſolutely hinders the head of the bone from being at all moved, notwithſtanding the extenſion is very conſiderable. In ſuch a caſe, bleeding and the warm bath are to be tried, in order to bring on a temporary weakneſs and relaxation, during which the attempts at reduction may be made with the beſt proſpect of ſucceſs. But a ſtill more certain plan is long continued unremitting extenſion, which is ſure of fatiguing the reſiſting muſcles, and as ſoon as they are worn out, the bone may eaſily be replaced. Deſault in certain caſes did not ſucceed before the half, or even the whole of the day had been ſpent in keeping up the extenſion, by means of his apparatus for the broken clavicle, which apparatus draws outward the ſhoulder and alſo the muſcles. (See Fracture *of the Clavicle.*) The muſcles can only ſupport a violent contraction a certain time. To permanent extenſion, though moderate in degree, they cannot make long reſiſtance, they become fatigued, they are incapable of hindering the head of the bone from being moved in the deſired direction, and the reduction is accompliſhed.

We have ſeen that Mr. Pott and Deſault have particularly adverted to the difficulty of reduction, ariſing from the bone being preſſed againſt the neck of the ſcapula, when the elbow was depreſſed, before the extenſion had ſufficiently diſengaged the head. Mr. Hey has alſo noticed this obſtacle to reduction, as follows: "the difficulty of reducing a diſlocated humerus, not only ariſes from the reſiſtance or compreſſion of the muſcles; but alſo from the reſiſtance which is made by the preſſure of the glenoid proceſs againſt the neck of the humerus, when the head of the bone lies deep in the axilla beyond that proceſs. This hindrance to reduction will be increaſed in proportion to the depreſſion of the acromion; if the extenſion is made in a horizontal direction. For in this caſe the edge of the glenoid cavity pitches againſt the neck of the humerus, and, in ſome degree, prevents the head of the bone from advancing forwards. In order to remove this hindrance, the head of the humerus muſt be lowered by elevating the arm, and the edge of the glenoid cavity raiſed from the neck of the humerus by repreſſing the acromion." Mr. Hey then ſtates that he has now, for ſeveral years, preferred the method recommended by Mr. Bromfield, for repreſſing the acromion during the extenſion, and he inſiſts on the propriety of bending the fore-arm, before applying the means for extenſion, ſo that the biceps may be relaxed as much as poſſible, and not hinder the glenoid cavity from being repreſſed. See Practical Obſervations in Surgery, p. 299, 300. edit. 2. A deſcription of Bromfield's method may be found in this gentleman's Chirurgical Obſerv. and Caſes, vol. i. chap. 6. p. 269.

Luxations of the Elbow-joint, or of the Fore-arm from the Humerus.—Here authors have generally deſcribed four kinds of diſlocation; *viz.* backwards, forwards, outwards, and inwards; but all theſe caſes do not occur with equal frequency, as experience proves, and the ſtructure of the joint might enable us to anticipate.

The luxation of the bones of the fore-arm backwards are by far the moſt common; the diſlocation of them forwards is very rare, was never obſerved by Deſault or Petit, and indeed cannot happen without a fracture of the olecranon. Luxations inwards or outwards are alſo not frequent, and when they do happen they muſt almoſt inevitably be incomplete, in conſequence of the great extent of the articular ſurfaces. The frequency of luxations backwards, compared with that of lateral diſlocations, is eſtimated in Deſault's works by Bichat as 10 to 1. The luxation forward being ſo uncommon, no compariſon whatever is aſſigned. The coronoid proceſs, forming only an inconſiderable curvature, cannot make any vaſt reſiſtance to the aſcent of the olecranon and radius, up the poſterior part of the humerus. But the kind of hook which the olecranon makes, effectually hinders this proceſs itſelf as well as the radius from ſlipping forwards in front of the humerus. Indeed, as we have already obſerved, a luxation in this direction may be regarded as impoſſible, without a fracture of the olecranon. The lateral ligaments, and the reciprocal manner in which the irregular ſurfaces of the articulation fit each other, are alſo ſtrong obſtacles to lateral diſlocations. Luxations backwards are, as we have ſaid, by far the moſt frequent.

In the luxation backwards, the radius and ulna may aſcend more or leſs behind the humerus; but the coronoid proceſs of the ulna is always carried above the articular pulley, and is found lodged in the cavity deſtined to receive the olecranon. The head of the radius is placed behind and above the external condyle of the humerus. The annular ligament, which confines the ſuperior extremity of the radius to the ulna, may be lacerated; in which caſe, even when the bones are reduced, it is difficult to keep them in their proper places, as the radius tends conſtantly to ſeparate from the ulna.

This luxation always takes place from a fall on the hand; for, when we are falling, we are led by a mechanical inſtinct to bring our hands forwards to protect the body. If in this caſe the ſuperior extremity, inſtead of reſting vertically on the ground, be placed obliquely with the hand nearly in a ſtate of ſupination, the repulſion which it receives from the ground will cauſe the two bones of the fore-arm to aſcend behind the humerus, whilſt the weight of the body preſſing on the humerus, directed obliquely downwards, forces its extremity to paſs down before the coronoid proceſs of the ulna.

The fore-arm, in this luxation, is in a ſtate of half-flexion, and every attempt to extend it occaſions acute pain. The ſituation of the olecranon, with reſpect to the condyles of the humerus, is changed. The olecranon, which in the natural ſtate is placed on a level with the external condyle, which is itſelf ſituated lower than the internal, is even higher than the latter.

This luxation may be miſtaken for a fracture of the olecranon, of the head of the radius, or even of the inferior extremity of the humerus. Such a miſtake is attended with very bad conſequences; for if the reduction be not effected before the end of fifteen or twenty days, it is often impoſſible to accompliſh it afterwards. The ſwelling, which ſupervenes in twenty-four hours after the accident, renders a diagnoſis more difficult; but the olecranon and internal condyle are never ſo obſcured, that the diſtance between them cannot be found to be increaſed, though Boyer makes a contrary aſſertion. It is true, that the rubbing of the coronoid proceſs and olecranon againſt the humerus, may cauſe a grating noiſe, ſimilar to that of a fracture; and ſome attention is certainly requiſite to eſtabliſh a diagnoſis between a fracture of the head of the radius, and a diſlocation of the fore-arm backwards.

The following method of reducing the caſe is adviſed by Boyer:—The patient being firmly ſeated, an aſſiſtant is to take hold of the middle part of the humerus, and make the counter-extenſion, while another aſſiſtant makes extenſion at the inferior part of the fore-arm. The ſurgeon, ſeated on the outſide, graſps the elbow with his two hands, by applying the fore-fingers of each to the anterior part of the humerus, and the thumbs to the poſterior, with which he preſſes on the olecranon, in a direction downwards and forwards. This method will be in general ſucceſsful. If the ſtrength of the patient, or the long continuance of the luxation, render it neceſſary to employ a greater force, a fillet is to be applied on the wriſt, to make extenſion, and a cuſhion is to be placed in the axilla, and the arm and trunk fixed, as is done in caſes of luxation of the humerus.

A bandage may afterwards be applied, in the form of a figure of 8, and the arm is to be kept in a ſling. The laceration which always takes place, is always followed by more or leſs ſwelling, which is to be combated by antiphlogiſtic means.

At the end of ſeven or eight days, when the inflammatory ſymptoms are nearly gone, the articulation is to be gently moved, and the motion is to be increaſed every day, in order to prevent an anchyloſis, to which there is a great tendency.

In this luxation, the annular ligament which confines the head of the radius to the extremity of the ulna, is ſometimes torn, and the radius paſſes before the ulna. In ſuch caſes, pronation and ſupination are difficult and painful, though the principal luxation has been reduced. The head of the radius may be eaſily replaced, by preſſing it from before backwards, and it is to be kept in its place by a compreſs, applied to the ſuperior and external part of the fore-arm. The bandage and compreſſes are to be taken off every two or three days, and re-applied. This is neceſſary, on account of the neceſſity of moving the articulation to prevent an anchyloſis.

If the luxation be not ſoon reduced, it becomes irreducible; the heads of the radius and ulna grow to the back part of the humerus, and the patient can neither bend nor extend his arm. However, in ſome caſes, eſpecially in young perſons, ſome motion is acquired in time; the heads of the radius and ulna making in the humerus cavities, in which they perform ſome motions, but always imperfectly.

The luxation forwards ſhould be treated as a fracture of the olecranon, with which it would be inevitably accompanied. It may be neceſſary, on account of the great injury done to the ſoft parts, to bleed the patient copiouſly, and put him on an antiphlogiſtic regimen.

As to the lateral luxations, either inwards or outwards, they are always incomplete, and eaſily diſcovered. They are reduced by drawing the humerus and fore-arm in contrary directions, and at the ſame time puſhing the extremity of the humerus, and the two bones of the fore-arm in oppoſite directions.

Theſe luxations cannot be produced without conſiderable violence; but when the bones are reduced, they are eaſily kept in their place. It will be ſufficient to paſs a roller round the part, to put the fore-arm in a middle ſtate, neither much bent nor extended, and to ſupport it in a ſling. But much inflammation is to be expected from the injury done to the ſoft parts. In order to prevent it, or at leaſt mitigate it, the patient is to be bled two or three times, and put on a low diet, and the articulation is to be covered with the lotio aq. litharg. acet. It is ſcarcely neceſſary to repeat, that the arm is to be moved as ſoon as the ſtate of the ſoft parts will admit of it.

The diſlocation of the fore-arm backward, is ſaid to occur ten times as frequently as lateral luxations; and thoſe forward are ſo rare, that no compariſon whatever can be drawn. Œuvres Chir. de Deſault, tom. i.

Lateral luxations have been divided into *complete*, that is, when the articular ſurfaces have entirely loſt their ſtate of reciprocal contact; and into *incomplete*, that is, when only one bone, or a part of it, is thrown off the humerus. But what cauſe can operate with ſufficient force to produce the firſt occurrence? The miſchief would alſo be ſo great, were ſuch a caſe to happen, that amputation would moſt likely be requiſite.

The incomplete lateral luxation may be produced by a blow, which drives the upper part of the fore-arm violently outward, or inward. A footman, ſays Petit, in falling from a coach, had his arm entangled in the ſpokes of a wheel, and a diſlocation outward was the conſequence. Another man luxated his fore-arm inward, by falling from his horſe and driving his arm againſt an uneven place.

When the ulna is puſhed into the ſituation of the radius, the ſpace between the olecranon and internal condyle is much greater than is natural. Theſe points of bone are always very diſtinguiſhable, let the joint be ever ſo much ſwollen; and hence, the information to be derived from an examination of them, may be obtained in every caſe, without exception. Alſo, when the ulna is puſhed into the place of the radius, the latter bone cannot be eaſily rotated, nor can the fore-arm be bent and extended in a perfect manner.

The diſlocation inward muſt be very uncommon, as the form of the bones is almoſt an inſurmountable obſtacle to ſuch an accident. It may happen, however, as the authority of Petit confirms.

All recent diſlocations of the elbow are very eaſily reduced, and as eaſily maintained ſo; for the reciprocal manner in which the articular ſurfaces receive each other, and their mutual eminences and cavities, will not readily allow the bones to become diſplaced again.

The application of a bandage in the form of a figure of 8, and ſupporting the arm in a ſling, are proper in all theſe caſes.

Luxation of the Radius from the Ulna.—The majority of authors, who have written on diſlocations of the fore-arm, have not ſeparately conſidered thoſe of the radius. Some detached obſervations, on luxations of its ſuperior extremity, are to be found here and there; a ſubject which Duverney alone has fully treated of. The diſlocations of its lower end, which are more frequent, and eaſy of occurrence, have almoſt eſcaped the notice of French, and alſo Engliſh writers. At preſent, caſes of this ſort have been ſo numerouſly collected, that a particular account of them may be offered.

Difference of Structure, between the two Joints of the Radius with the Ulna.—The radius, the moveable agent of pronation and ſupination, rolls round the ulna, which forms its immoveable ſupport, by means of two articular ſurfaces; one above, ſlightly convex, broad internally, narrow outwardly, and correſponding to the little ſigmoid cavity of the ulna, in which it is lodged; the other below, concave, ſemi-circular, and adapted to receive the convex edge of the ulna. Hence there are two joints, differing in their motions, articular ſurfaces, and ligaments. By aſcertaining ſuch differences, we ſhall be enabled to find out thoſe which exiſt between the luxations of the upper and lower head of the radius.

Above, the radius, in pronation and ſupination, only moves on its own axis; below, it rolls round the axis of the ulna. Here, being more diſtant from the centre, its motions muſt be both more extenſive and powerful than they are above. The head of the radius, turning on its own axis in the annular ligament, cannot diſtend it in any direction. On the contrary, below, the radius, in performing pronation, ſtretches the poſterior part of the capſule, and preſſes it againſt the immoveable head of the ulna, which is apt to be puſhed through, if the motion be forced. A ſimilar event, in a contrary ſenſe, takes place in ſupination. The front part of the capſule, being rendered tenſe, may now be lacerated.

Add to this diſpoſition, the difference of ſtrength between the ligaments of the two joints. Delicate and yielding below; thick and firm above; their difference is very great. The upper head of the radius, ſupported on the ſmaller immoveable articular ſurface of the ulna, it protected from diſlocation in moſt of its motions. On the contrary, its lower end, carrying along with it in its motions the bones of the carpus which it ſupports, cannot itſelf derive any ſolid ſtability from them.

Differences of Luxations of the Radius.—From what has been ſaid, the following concluſions may be drawn: 1, that with more cauſes of luxation, the lower articulation of the radius has leſs means of reſiſtance; and, that under the triple conſideration of motions, ligaments tying the articular ſurfaces together, and the relations of theſe ſurfaces to each other, this joint muſt be very ſubject to diſlocation. 2. That, for oppoſite reaſons, the upper joint cannot be very ſubject to ſuch an accident.

Indeed what could be the cauſe producing it in this ſituation? Can it ariſe from a violent pronation, or ſupination? The lower joint being the weakeſt would give way the firſt, and however forcible any motion of this kind might be, the upper head of the radius would only be rotated on its own axis. How then can this part be diſlocated without being puſhed forward or backward? All the muſcular and ligamentous ſupport of the joint muſt be broken; and the muſcles and ligaments are too ſtrong to admit of this, and the motion itſelf too feeble. Can the accident originate from any impulſe on the radius, from below upward? The immoveable reſiſting end of the humerus would then prevent the radius from quitting the capſular ligament. Can the accident ariſe from a violent extenſion or flexion of the fore-arm? Here, the whole force operating on the ulna, the radius ſcarcely feels the impulſe.

Hence, accidental diſlocations of the radius, ſuddenly produced by an external cauſe, muſt, if they ever happen, be exceedingly uncommon at its upper end. This is not the caſe with reſpect to ſuch diſlocations which occur ſlowly at this joint, eſpecially in children, in whom the ligaments become lax in conſequence of repeated efforts. With this kind of caſe, we have here nothing to do.

Experience ſometimes ſeems to militate againſt the above reflections. Duverney quotes ſome inſtances of diſlocations of the radius, ſuddenly produced by external cauſes. Some other practitioners mention ſimilar examples. But, in their examinations, have theſe men paid all due attention? An analogous caſe has been tranſmitted to the French Academy of Surgery, by one of its fellows; but doubts have ariſen concerning its reality, and there are too few facts for, and too much preſumptive evidence againſt, the truth of ſuch caſes to believe their exiſtence. Deſault himſelf rejected their reality.

Luxation of the lower End of the Radius.—The cauſes are the ſame as thoſe of all analogous caſes. 1. Violent action of the pronator and ſupinator muſcles. This is, doubtleſs, a very unuſual cauſe, for Deſault never knew an inſtance of it. 2. External force, moving the radius violently into a ſtate of pronation, and rupturing the back part of the capſule; or into a ſtate of ſupination, and breaking the front part of the capſular ligament.

Hence, there are two kinds of diſlocation; one forward, the other backward. The firſt is very frequent; the ſecond is much leſs ſo. The latter caſe never preſented itſelf to Deſault but once, in the dead body of a man who had both his arms diſlocated, and no particulars could be learnt. The other caſe occurred very often in the practice of this eminent ſurgeon. Five examples have been publiſhed. Doubtleſs, this difference is owing to all the principal motions of the radius being in the prone direction.

This obſervation is confirmed by the fact, that the lower joint of the radius, in the dead ſubject, may be diſlocated as eaſily by a ſupine, as a prone motion of this bone.

The ſymptoms of the luxation forward are: 1. Conſtant pronation of the fore-arm. 2. An inability to perform ſupination, and great pain on this being attempted. 3. An unuſual projection at the back of the joint, in conſequence of the protruſion of the little head of the ulna through the capſule. 4. The poſition of the radius is more forward than natural. 5. Conſtant adduction of the thumb, which alſo is almoſt always extended. 6. A half-bent ſtate of the fore-arm, and very often of the fingers. This, indeed, is the poſition which the fore-arm uſually aſſumes in all affections of its bones, and, in the preſent inſtance, the poſture cannot be changed without conſiderable pain. 7. More or leſs ſwelling around the joint. This ſometimes comes on immediately after the accident, but always afterwards, if the reduction ſhould remain unaccompliſhed. The condition of the joint may thus be obſcured, and the accident miſtaken for a ſprain; as Deſault often obſerved to have occurred with ſurgeons, who had been called to theſe accidents before him. The ſerious conſequence of this miſtake is, that no attempt at reduction is made, and the articular ſurfaces having time to contract adheſions, the diſorder is frequently rendered irremediable.

A luxation of the radius backward is characterized by ſymptoms the reverſe of thoſe above-mentioned. They are a violent ſupination of the limb; inability to put it prone; pain on making the attempt; a tumour in front of the fore-arm formed by the head of the ulna; a projection backward of the large head of the radius; and abduction of the thumb.

Reduction.—When the diſlocation is forward, an aſſiſtant is to take hold of the elbow, raiſing the arm a little from the body; another is to take hold of the hand and fingers.

The ſurgeon is to take hold of the end of the fore-arm with both his hands; one applied to the inſide, the other to the outſide, in ſuch a manner, that the two thumbs meet each other before, between the ulna and radius, while the fingers are applied behind. He is then to endeavour to ſeparate the two bones from each other, puſhing the radius backward and outward, while the ulna is held in its proper place. At the ſame time the aſſiſtant, holding the hand, ſhould try to bring it into a ſtate of ſupination, and conſequently the radius, which is its ſupport. Thus puſhed, in the direction oppoſite that of the diſlocation, by two powers, the radius is moved outward, and the ulna returns into the opening of the capſule, and into the ſigmoid cavity.

If chance ſhould preſent a diſlocation of the radius backward, the ſame kind of proceeding, executed in the oppoſite direction, would ſerve to accompliſh the reduction.

Luxations of the Wriſt.—The carpal bones may be luxated from the lower ends of the radius and ulna forwards, backwards, inwards, or outwards. The two firſt caſes, eſpecially the one backwards, are the moſt frequent. The diſlocation backwards is rendered eaſy by the direction of the convex articular ſurfaces of the ſcaphoid, ſemilunar, and pyramidal bones, which ſloping more backwards than forwards, muſt make them more diſpoſed to ſlip in this direction than any other. The accident may be cauſed by a fall on the back of the hand, while much bent; in which event the firſt row of the carpal bones ſlide backwards into the oblong cavity of the radius, lacerate the poſterior ligament, and form an eminence behind the lower ends of the bones of the fore-arm. This prominence, the depreſſion in front of the wriſt, and the extraordinary flexion of the hand, which cannot be extended, are the characteriſtic ſigns of this kind of diſlocation.

The diſlocation forwards generally ariſes from a fall on the palm, the fingers being extended, and more force operating on the lower than upper part of the palm. The luxation is ſeldom complete; and the hand remains painfully extended. The great many tendons, which run before the wriſt, and the annular ligament being puſhed forward, the prominence formed by the carpal bones, in front of the ends of the radius and ulna, is not eaſily detected, and the caſe may be miſtaken for a ſprain.

Diſlocations inwards, or outwards, are never complete. The projection of the carpal bones at the inner or outer ſide of the joint, and the diſtortion of the hand, make ſuch caſes ſufficiently evident.

All diſlocations of the wriſt are very eaſy of reduction. For this purpoſe, gentle extenſion muſt be made, while the two ſurfaces of the joint are made to ſlide on each other in a direction contrary to what they took when the accident occurred.

Diſlocations of the wriſt are always attended with a great deal of ſpraining of numerous tendons and laceration of ligaments, and conſequently conſiderable ſwelling generally follows, and the patient is a long time in regaining the perfect uſe of the joint. To relieve the ſymptoms as much as poſſible, the beſt plan is to keep the hand and wriſt continually covered with linen wet with the ſaturnine lotion, and to put the fore-arm and hand in ſplints, as in the caſe of a fracture. (See FRACTURE.) The arm muſt alſo be kept perfectly at reſt in a ſling.

When the ruptured ligaments have united, the uſe of liniments will tend to remove the remaining ſtiffneſs and weakneſs of the joint.

Luxations of the Bones of the Carpus and Metacarpus.—A diſlocation of the carpal bones from each other ſeems almoſt impoſſible. The os magnum, however, has been known to be luxated from the deep cavity formed for it by the ſcaphoides and ſemilunare, in conſequence of too great a flexion of the bones of the firſt phalanx on thoſe of the ſecond, and it forms a tumour on the back of the hand. Chopart. Boyer. Richerand.

The metacarpal bones are never luxated from each other. The firſt one is ſometimes, though very rarely, puſhed off the trapezium.

Luxations of the Fingers.—The firſt phalanges may be diſlocated backwards off the heads of the metacarpal bones. A luxation forwards would be very difficult, if not impoſſible, becauſe the articular ſurfaces of the metacarpal bones extend a good way forwards, and the palm of the hand makes reſiſtance to ſuch an accident. The firſt phalanges of the thumb and little finger can alone be diſlocated inwards; and the firſt phalanx of the thumb is alone ſubject to be luxated outwards. This phalanx is alſo moſt liable to diſlocations backwards, behind the head of the firſt metacarpal bone, in which caſe it remains extended, while the ſecond is bent.

Theſe diſlocations ſhould be ſpeedily reduced; for, after eight or ten days, they become irreducible. In a luxation of the firſt bone of the thumb, which was too old to be reduced, Deſault propoſed cutting down to the head of the bone, and puſhing it into its place with a ſpatula. Diſlocations of the thumb and little finger inwards, that of the thumb outwards, and luxations of the firſt phalanges of the other fingers backwards, are all reduced by making extenſion on the lower end of the affected thumb, or finger. The firſt and ſecond phalanges may alſo be diſlocated backwards.

After the reduction, the thumb or finger affected ſhould be rolled with tape, and incaſed, and ſupported in paſteboard, till the lacerated ligaments have united; taking care to keep the hand and fore-arm quietly in a ſling.

Luxations of the Femur, or Thigh-bone, at the Hip.—Theſe diſlocations may take place upwards and outwards on the exernal ſurface of the os ilium; upwards and forwards on the body of the os pubis; downwards and inwards on the foramen ovale; and downwards and outwards on the os iſchium.

The luxation upwards and outwards, and that downwards and inwards, are the moſt frequent, and it is not eaſy to ſay which of theſe two caſes happens moſt often. It is to be underſtood, however, that diſlocations of the hip are far leſs common than thoſe of the ſhoulder. We have ſeen only three caſes of the firſt deſcription; but, at leaſt, from fifteen to twenty diſlocations of the ſhoulder. Mr. Hey informs us, that ſeven inſtances of the latter accident, and three of the former, are all that have occurred in his practice. (Pract. Obſ. p. 314. edit. 2.) The following account of luxations of the thigh-bone at the hip is from Boyer's work on the Diſeaſes of the Bones, tranſl. by Farrell.

No anatomical reaſon can be given for the frequency of the diſlocation upwards and outwards; the edge of the acetabulum projects more at the ſuperior and exterior parts than at any other; the orbicular ligament, which is very thick at this place, and the interior ligament of the articulation, which muſt be previouſly ruptured, oppoſe the diſlocation in this direction. There is little, on the contrary, to oppoſe the luxation downwards on the foramen ovale. The inferior and internal part of the circumference of the cavity, the place by which the bone eſcapes in this ſpecies of luxation, preſents a deep notch formed into a hole by a ligament, under which the veſſels of the articulation enter. The orbicular ligament is thinner here than at any other place; the motion of abduction, in which this luxation takes place, is more extenſive than that of adduction; and laſtly, the round ligament within the articulation does not oppoſe it, as it may take place without its being ruptured.

Luxation upwards and forwards is very rare; that downwards and backwards is ſtill more ſo; and, perhaps, as ſhall be obſerved farther on, never occurs but ſecondarily.

When, by a fall from a place more or leſs elevated, on the ſoles of the feet, or on the knees, the thigh is puſhed forwards and inwards, the head of the femur, forced towards the ſuperior and external part of the acetabulum, breaks the internal and orbicular ligaments, eſcapes through the laceration in the latter, and aſcends on the external face of the os ilium; but as the part of the os ilium immediately above and at the external ſide of the cavity is very convex, the head of the femur ſoon abandons its firſt poſition, and ſlides backwards and upwards into the external foſſa of the os ilium, following the inclination of the plane towards this foſſa, and obeying the action of the glutæi muſcles, which draws it in this direction. The head of the femur, in aſcending thus on the external face of the os ilium, puſhes upwards the glutæus minimus, which forms a ſort of cap for it; and the glutæus maximus and medius are relaxed by the approximation of the points into which they are inſerted. The pyriformis is nearly in its natural ſtate, the gemini, obturatores, and quadratus femoris, are a little elongated. The pſoas magnus and iliacus internus are relaxed, as are alſo the other muſcles inſerted into the trochanter minor. If to this deſcription it be added, that the orbicular ligament, torn at its ſuperior part, is ſtretched over the acetabulum, and covers it, an exact idea may be formed of the change occaſioned in the ſurrounding parts by this luxation of the femur.

The affected thigh is ſhorter than the ſound one; it is a little bent, and carried inwards. The knee inclines more forwards and inwards than the oppoſite one; the leg and thigh are turned inwards, and the foot points in this direction. The trochanter major is brought nearer the anterior and ſuperior ſpinous proceſs of the os ilium, and is at the ſame time elevated and carried a little forwards; the latter circumſtance may be conſidered as the neceſſary conſequence of the rotation inwards of the thigh. The natural length of the limb cannot be reſtored without reducing the luxation; the foot cannot be turned outwards, and any attempt to do ſo cauſes pain; but the inclination of the foot inwards may be increaſed. If the patient endeavours to walk, he extends the foot to put the top of it on the ground; and though the heel is raiſed, he is ſtill lame; for the diſeaſed limb remains always ſhorter than the other, and the pain occaſioned by the attempt to walk renders progreſſion ſtill more difficult.

Luxation of the femur upwards and outwards has nothing in common with the fracture of the neck of this bone but the ſhortneſs of the limb. The eaſy rotation of the member outwards and inwards, &c. &c. preclude all poſſibility of confounding them, unleſs the ſurgeon be remarkably inattentive.

It is difficult to aſſign the cauſe of the foot and remainder of the limb being turned inwards in this luxation. It may be eſtabliſhed as a general rule, that luxated members always take a direction determined by the elongation of the muſcles of the ſide oppoſite that to which the luxated bone is carried: thus, in luxation of the arm downwards and inwards, the deltoides and infraſpinatus muſcles, lengthened by the ſeparation of their points of inſertion, move the elbow out from the body, and give the arm an oblique direction. In this caſe, the obturatores, gemini, and quadratus femoris, being elongated, the point of the foot ought to be turned outwards. This phenomenon depends perhaps on the external portion of the orbicular ligament which comes from the anterior and inferior ſpine of the os ilium; this portion, which is very thick, being elongated in the luxation outwards, draws the great trochanter forwards, and conſequently turns inwards the entire limb.

The difficulty of reducing luxations of the thigh, from the ſtrength and number of its muſcles, renders every diſlocation of which it is ſuſceptible very diſtreſſing. The laceration and injury done to the ſoft parts are nearly as conſiderable as in diſlocation of the ginglimoidal articulations.

To effect the reduction, the patient is extended on a table firmly fixed, and covered with a mattreſs, which is to be tied to it; a ſheet, folded longitudinally, is applied to the groin of the ſound ſide, in order to make counter-extenſion. The middle part is applied againſt the ſuperior and internal part of the thigh, and the two ends paſſed before and behind the pelvis, croſs on the hip, and are held by a ſufficient number of aſſiſtants. By this means the trunk is fixed, but there is nothing to prevent the pelvis from yielding to the extending force. To anſwer this purpoſe, another ſheet, folded in a ſimilar manner, is placed tranſverſely on the ſpine of the os ilium, and its ends are brought horizontally before and behind the abdomen towards the hip of the oppoſite ſide, where they are held by aſſiſtants. This apparatus, ſimilar to that placed on the point of the ſhoulder in a luxation of the arm, anſwers the ſame purpoſes, as it preſſes only on the ſuperior part of the glutæus maximus and medius, and does not ſtimulate them to contract. The extending force is to be applied to the inferior part of the leg, in order to have it as far as poſſible from the parts which reſiſt the return of the head of the femur. The number of aſſiſtants for making extenſion and counter-extenſion is to be proportioned to the exigencies of the circumſtances and the power of muſcles. The ſurgeon, placed at the external ſide of the limb, preſſes on the great trochanter, and when the head of the bone has been brought on a level with the acetabulum, he endeavours to force it into it.

In this country, as we have previouſly explained, ſurgeons generally apply the extenſion to the diſlocated bone itſelf, juſt above the knee. The diſappearance of all the ſymptoms, and eſpecially the noiſe made by the head of the femur on re-entering its cavity, indicate the ſucceſs of the operation. This ſucceſs is ſeldom obtained without having previouſly made ſeveral fruitleſs endeavours, whether from not employing ſufficient force to make extenſion and counter-extenſion, or from a ſpaſmodic contraction of the muſcles obſtinately reſiſting the reduction.

When the bone is reduced, it is prevented from leaving its place by bringing the thighs together by means of a bandage placed above the knees. In the generality of caſes, it will be adviſable to take ſome blood from the patient, and confine him for a few days after the accident to a very low diet; and in all caſes the hip is to be covered with emollient and reſolvent applications, which may be kept on by means of the ſpica bandage for the groin. This bandage is well adapted to this uſe, but is not at all fit for keeping the luxated bone in its proper place, as its action is made too near the centre of motion. The patient ſhould be particularly directed not to walk too ſoon, nor at any time to fatigue too much the affected joint.

Luxation of the thigh downwards and inwards, or into the foramen ovale, is nearly as frequent as that juſt deſcribed; it is favoured, as we have ſaid, by the great extent of the motion of abduction of the thigh; by the notch at the inferior and internal part of the acetabulum; by the weakneſs of the orbicular ligament at this ſide; and laſtly, by the ſituation of the round ligament, the rupture of which is not a neceſſary conſequence of it. It is occaſioned by a fall on the feet or knees conſiderably ſeparated from one another. The head of the femur ſlides from without inwards on the bottom of the acetabulum, and comes againſt the inferior and internal portion of the orbicular ligament, which it lacerates, and paſſes on to the foramen ovale between the ligament and the obturator externus.

In this ſpecies of luxation of the femur, the ſtate of the ſoft parts ſurrounding the articulation is as follows: the glutæi, gemini, obturatores, quadratus femoris, pſoas magnus, and iliacus internus, are elongated by the ſeparation of their points of inſertion. The rotation of the limb outwards is produced by the elongation of theſe muſcles. The adductors, elongated, form at the interior part of the thigh a tenſe cord, which is felt from the pubis to below the middle of the thigh.

The affected thigh is longer than the ſound one; the head of the femur being placed lower than the acetabulum, the great trochanter is removed to a greater diſtance from the anterior and ſuperior ſpinous proceſs of the os olium, and the thigh is flattened in conſequence of the elongation of the muſcles. The adductors, extended obliquely from the pubis to the femur, form a cord which elevates the ſkin of the internal part of the thigh. A hard round tumour is felt at the inner and ſuperior part of the thigh, formed by the head of the femur, which elevates the ſoft parts ſituated before the foramen ovale. The leg is ſlightly bent; the knee and foot, turned outwards, cannot be brought back to their proper direction. If the patient attempt to walk a few ſteps, he makes a ſemicircular motion with the foot, and places at once the entire ſole on the ground; and though he keep the knee bent, ſtill the limb is too long, and occaſions lameneſs. The mode of progreſſion of perſons whoſe thigh is luxated in this direction may be compared to that of a mower: the elongated extremity, like the leg which the mower keeps forwards, deſcribes a ſemicircular motion outwards.

All theſe ſymptoms, taken together, form a combination too ſtriking to admit of error in our diagnoſis, or to allow us to confound this luxation with any other, or even with fracture of the neck of the femur.

The prognoſis is ſomewhat leſs unfavourable in this than in luxation upwards and outwards. The muſcles, which might oppoſe the reduction, being all elongated by the very circumſtance of the luxation itſelf, render the reduction eaſier; beſides, the contuſion of the ſoft parts is leſs conſiderable, and the round ligament is ſtretched, but not broken. It is reduced in the ſame manner as the other, except that the extenſion is to be made at firſt downwards and outwards, before bringing the limb to its natural direction.

Luxation upwards and forwards is much rarer than the preceding, and more than one practitioner has deſcribed it rather as poſſible than as having abſolutely taken place. It has been alſo called luxation on the pubis, though it may be reaſonably preſumed that the head of the femur is removed

moved ſo far from the acetabulum but in very few caſes, and that it only advances near the ilio-pectinæal eminence. Deſault met with a luxation of this kind in a porter of the flour-market; his foot ſlipped, and the leg and thigh were carried backwards, whilſt a heavy burden was placed on his ſhoulders. His body was bent backwards, and the head of the femur, directed forwards and upwards, burſt its capſule and triangular ligament, and paſſed under the crural arch into the fold of the groin, where it was eaſily felt through the integuments.

The whole extremity is turned outwards in this luxation; it is alſo ſhortened. The great trochanter, brought nearer the anterior and ſuperior ſpinous proceſs of the os ilium, is placed before that eminence; that part into which the pſoas and iliacus muſcles are inſerted is raiſed up, and a tumour is formed by the head of the femur in the fold of the groin, which compreſſes more or leſs the crural nerves placed at the external ſide of the veſſels of this name, and occaſions dull pains, with numbneſs and even paralyſis, when the contuſion has been very great; the knee, turned outwards, is alſo carried backwards. This ſymptom is particularly remarkable ſhortly after the accident has taken place; for if the diſlocation has continued ſome days, the thigh may reaſſume its natural direction, and perform even gentle rotatory motions inwards, the direction outwards ſtill continuing. It is proper to remark, with reſpect to the tumour formed by the head of the femur in the groin, that the pſoas and iliacus muſcles may, in fractures of the femur immediately under the little trochanter, bring forwards the ſuperior portion of this bone, cauſe it to project in the groin, and form an eminence there which might impoſe on us, if we were not apprized of the poſſibility of ſuch an event taking place.

This luxation is particularly dangerous, as it requires a combination of violent efforts to produce it, and as it neceſſarily muſt be accompanied with great contuſion and lacerations. Neverthele∫s, in the caſe treated by Deſault, the reduction, though difficult, was not followed by any ſerious accident; and the patient, at the end of fifteen days, had almoſt entirely recovered the ſtrength and uſe of his limb.

The proceſs for reducing it does not differ from that pointed out for the others.

Luxation of the femur downwards and backwards may, like that of the humerus inwards and forwards, be either primary or ſecondary. It is primary, when, in conſequence of ſome effort, the head of the femur is forced from the acetabulum at its inferior and poſterior part, and is placed at the junction of the os ilium and iſchium; it is ſecondary, when it ſucceeds to the luxation upwards and outwards, the head of the femur, which was placed at firſt in the external iliac foſſa ſliding downwards and backwards, its paſſage in this direction being favoured by the bending of the thigh on the pelvis.

In theſe two caſes, the head of the femur reſts againſt that part of the oſſa innominata where the os ilium and iſchium join. The muſcles which cover the poſterior part of the articulation, ſuch as the pyriformis, gemini, obturatores, and quadratus femoris, are raiſed up and ſtretched; the pſoas magnus and iliacus internus are in a great ſtate of tenſion, and this explains the turning of the limb outwards. When this luxation is primary, the extremity is lengthened; a hard tumour is felt at the poſterior and inferior part of the thigh; the great trochanter, by deſcending, is removed farther from the ſpine of the os ilium, and the knee and ſole of the foot are turned outwards; but if it be ſecondary, the thigh is much bent againſt the pelvis; the knee and ſole of the foot are turned inwards, becauſe the primary luxation has been upwards and outwards. Secondary luxation in this direction is much more frequent than the primary; in reducing it the ſame rules are to be obſerved as in other ſpecies of luxations.

Whatever may be the ſpecies of luxation, we ſhould always be certain that it is perfectly reduced before leaving the patient. To aſcertain this, we ought to move the thigh in various directions, taking care at the ſame time to omit that motion which might reproduce the luxation.

When a luxation of the femur upwards and outwards has not been reduced, the thigh remains ſhort, and becomes ſhorter every day, until the head of the femur has made for itſelf a kind of articular cavity in the ſurface of the external iliac foſſa. The acetabulum leſſens in ſize, or is entirely obliterated. The glutæus minimus is emaciated, and ſerves as an orbicular ligament to the new articulation. The head of the femur loſes its ſpherical figure, is forced backwards, and its neck becomes ſhorter; the perſon is lame, and walks on the point of the foot. If the luxation is downwards and inwards, the foramen ovale becomes the new articulating cavity; the obturator externus, raiſed and puſhed inwards by the head of the femur, becomes emaciated and ligamentous, and it and the glutæus minimus even ſometimes oſſify. The lameneſs ariſes in this caſe from the exceſs of length of the diſeaſed limb, which always diminiſhes in ſize, in conſequence of the muſcles not being ſufficiently exerciſed, or their action being impeded.

Luxations of the Patella, or Knee-pan.—It is impoſſible for the patella to be diſlocated downwards without the tendon of the extenſor muſcles of the leg being firſt ruptured; nor upwards, unleſs the ligament of the patella is broken. In this laſt caſe the extenſor muſcles may draw the bone more or leſs upwards towards the groin.

Diſlocations inwards, or outwards, may happen without other miſchief. They occur when the patella is violently puſhed in one of theſe directions. According to Boyer, great relaxation of the inferior ligament of the patella may create a prediſpoſition to the accident. Such, ſays he, was the caſe of the young man, whoſe patellæ were luxated outwards by the ſlighteſt motion of the knees, as related by Hard in the Journ. de. Méd.

The diſlocation outwards is the moſt common. This may depend partly on the internal edge of the patella projecting more than the external one, and, therefore, being more expoſed to violence; and partly, on the outer condyle of the thigh-bone allowing the patella to ſlip over it with facility.

Boyer obſerves, that the external condyle of the femur, which is naturally more eminent anteriorly than the inner one, may be depreſſed, and this depreſſion, from whatever cauſe it may proceed, favours the diſlocation outwards. He tells us that he has ſeen, among the military conſcripts, three caſes of luxation of the left patella outwards from ſuch a cauſe. In theſe three individuals the patella was placed at the outſide of the condyle, though not altogether away from it. The anterior ſurface of the bone was turned outwards; the poſterior one inwards; the internal edge was placed anteriorly, and projected under the ſkin, while the external edge was directed backwards. In all theſe inſtances the luxation had taken place during infancy. By relaxing the extenſors of the leg, and bending the thigh, the patella could eaſily be replaced; but unleſs confined in its proper ſituation, it was ſoon diſlocated again.

Another caſe is recorded by the ſame writer, where a luxation of the patella outwards followed a gunſhot-wound, in the vicinity of the knee.

Luxations outwards, produced by external violence, are rarely complete, as ſuch an accident could only ariſe from a degree of force that is hardly ever exerted. The diſlocation is much promoted by the knee being, at the time of the blow, in a moderate ſtate of flexion, as the extenſor muſcles of the leg and ligament of the patella are then relaxed, and the inner edge of the patella very prominent, ſo as to be expoſed to the action of external force.

In luxations of the patella outwards, the patient experiences ſevere pain, and cannot bend his knee. The latter joint is deformed; the pulley of the condyles of the femur may be felt through the ſkin; the patella forms a tumour in front of the external condyle; the anterior ſurface of the knee-pan is become the external one, while the poſterior ſurface is now internal. The internal edge is turned more forwards than inwards, and the external one is now turned almoſt quite backwards.

The ſymptoms of a luxation inwards are very analogous to thoſe of the preceding caſe, allowance being made for the difference of ſituation and the relation of parts to each other.

In every caſe of diſlocated patella, the reduction ſhould be effected as ſoon as poſſible. The patient is to be laid on a bed, with his leg extended and thigh bent. In this poſition the extenſor muſcles and their tendon, and the ligament of the patella, are relaxed, and the latter bone may eaſily be put back into its proper ſituation by preſſure.

The inflammatory ſwelling, which uſually affects after an accident of this nature, is to be ſubdued by general and topical bleeding, reſt, and the ſaturnine lotions. After the ſwelling and inflammation are diminiſhed, the joint ſhould be gently bent and extended every day, and rubbed with the linimentum ſapon. comp.

Luxations of the Knee.—The tibia, at its articulation with the condyles of the femur, may be luxated either backwards, forwards, or to either ſide.

A complete luxation of the knee is an exceedingly uncommon circumſtance, and could not happen without a total laceration of all the numerous ligaments and tendons which ſtrengthen the joint. For the production of ſuch miſchief, we muſt ſuppoſe the operation of a degree of violence that hardly ever takes place, putting out of the queſtion the tearing away of limbs by cannon-balls. Even incomplete luxations, inwards or outwards, are very rare, ſo much are theſe accidents oppoſed by the extent of the articular ſurfaces, and the ſtrength of the ligaments and tendons. Diſlocations forwards or backwards are ſtill more uncommon, in conſequence of the manner in which the patella and crucial ligament reſiſt their occurrence. However, when the leg is fixed, and the body and thigh are forced onwards, the tibia may be partly forced away from the lower end of the femur to one ſide or another. The accident implies the operation of conſiderable violence. The deformity makes the nature of the caſe very manifeſt. The reduction is eaſily accompliſhed by puſhing the heads of the bones in oppoſite directions, while the articular ſurfaces are a little ſeparated by moderate extenſion of the limb. After the reduction, the main buſineſs of the ſurgeon is to avert and diminiſh inflammation of the joint by cold waſhes, leeches, veneſection, opening medicines, low diet, perfect reſt, &c.

Luxations of the Ankle Joint.—The foot may be luxated inwards, or outwards; or forwards, or backwards; and the diſlocation in any of theſe directions may be complete or incomplete. Luxations inwards or outwards, are the moſt frequent. The former, however, are more common than the latter. As the internal malleolus does not deſcend ſo far as the external, the aſtragalus has a leſs ſpace to deſcribe from without inwards, than in the contrary direction. The diſlocation inwards is occaſioned by a violent abduction of the foot, and is characterized by the ſole being turned outwards, and the back of the foot inwards, by the pain and inability of moving the foot; and, laſtly, by the projection made by the aſtragalus below the internal malleolus.

The luxation outwards is attended with an impoſſibility of moving the foot; the ſole is turned inwards and the back of the foot outwards; and the aſtragalus projects below the external malleolus.

All luxations of the foot ſhould be reduced as quickly as poſſible. One aſſiſtant is to make the counter-extenſion by fixing the leg, and, while another draws the foot, the ſurgeon is to puſh the latter part in a direction contrary to that in which it is luxated. Nothing facilitates the reduction of diſlocations of the ankle ſo materially as relaxing the powerful muſcles of the calf of the leg, by bending the knee and extending the foot.

When the reduction has been accompliſhed, the limb is to be put in ſplints, juſt as if the caſe were a fracture of the leg, (ſee Fracture,) and the antiphlogiſtic treatment is indicated for the prevention of violent inflammation.

Theſe caſes, in former days, generally ended ſo badly, that J. L. Petit recommends amputation never to be delayed more than twenty-four hours after the accident. More modern experience, however, has proved the general poſſibility of curing diſlocations of the ankle, and this even when the caſe is compound, that is, attended with a wound communicating with the injured point.

A fracture of the fibula near its lower end is a frequent complication of a luxation of the foot inwards. That bone, therefore, ſhould always be carefully examined in the latter caſe.

Luxations forwards and backwards, leſs frequent than thoſe deſcribed, are however ſometimes met with. The firſt is occaſioned by a fall backwards while the foot is fixed to the ground; the ſecond by a fall on the feet, with the body inclined forwards and the leg much bent. The luxation forwards is more difficultly produced than that backwards, on account of the articular pulley of the aſtragalus, which inclines towards the poſterior ſide, being permitted to ſlide much on the tibia without abandoning it in the extenſion of the foot. When the extenſion is carried too far, luxation forwards is produced.

In the luxation backwards, the external and poſterior ligaments and the poſterior part of the capſule are torn; in that forwards the anterior and external ligaments, the anterior fibres of the internal lateral ligament, and the anterior part of the capſule, are torn. The ſymptoms of the firſt ſpecies are, a diminution of length in that part of the foot between the lower part of the leg and the anterior extremity of the toes, elongation of the heel, tenſion of the tendo Achillis, and relaxation of the extenſors of the toes. It is impoſſible either to bend or extend the foot; this ſymptom diſtinguiſhes luxation from ſprain, in which the foot may be moved, though not without pain, however high the inflammation may be.

Contrary ſymptoms accompany the luxation forwards: the foot is lengthened, the heel is ſhortened, and the foot, much extended, cannot be bent, &c.

The reduction of both is eaſily effected, after which it will be neceſſary to put the limb in ſplints, and lay it in the bent poſture.

The very thick and ſhort ligamentous ſubſtance which unites the aſtragalus to the os calcis, binds them ſo ſtrongly together, that they follow one another in their motions and form, as it were but one bone. Hence they are never completely ſeparated, even in the moſt deſperate caſes of luxation of the foot; but one or both of them may be luxated from the ſcaphoides and cuboides. The tranſverſe direction of the articulation formed by theſe four bones, ſuggeſted to Chopart the ingenious idea of amputating only a part of the foot. But theſe luxations, leſs dangerous than the others, can be occaſioned only by a violent effort in which the anterior part of the foot is fixed, as happened in the two caſes related by J. L. Petit, the foot being faſtened in an iron grate, whilſt the body was drawn backwards. The aſtragalus and os calcis may, under theſe circumſtances, be luxated, but particularly the former, the head of which ſlides from below upwards, in the cavity of the poſterior face of the ſcaphoides, and forms a tumour on the back of the foot. The inflammatory ſwelling renders it often difficult to aſcertain this luxation. It is not eaſily reduced, even ſhortly after it has taken place. Boyer failed in a caſe of this kind in which the head of the aſtragalus was luxated upwards and inwards by a fall from a horſe; but in ſome time the perſon felt no inconvenience from the affection, he could walk without pain or lameneſs, and nothing remained but the deformity occaſioned by the tumour.

The other bones of the tarſus and metatarſus are too ſtrongly tied together to admit of luxation. The phalanges of the toes cannot be luxated by external violence, on account of their ſhortneſs. However, the poſſibility of luxation of the firſt phalanx of the great toe from the firſt bone of the metatarſus may be eaſily conceived. See Boyer on the Bones, vol. ii.

Compound Luxations.—We ſhall conclude the preſent article with a few remarks on the treatment of compound diſlocations. The luxation of a large joint, being conjoined with an external wound, leading into the capſular ligament, is a circumſtance that has a particular tendency to increaſe the danger of the accident. In many caſes we ſee injuries of this deſcription followed by violent and extenſive inflammation, abſceſſes and ſloughing, fever, delirium, and death. When the patient is advanced in years, is much debilitated, or of an unhealthy irritable conſtitution, compound luxations, eſpecially if attended with much contuſion and other injury of the ſoft parts, and wrongly treated, very often have a fatal termination. This, however, is not the general event of theſe caſes, and whatever may have happened in former times, we now know, that in the preſent improved ſtate of ſurgery ſuch accidents moſtly admit of cure. We would not, however, by any means inſinuate cenſure againſt every inſtance of amputation performed in theſe caſes: we know that ſuch operation is occaſionally indiſpenſable immediately when the accident is ſeen, and we are equally aware, that it may become neceſſary in a future ſtage, when extenſive abſceſſes or ſloughing, joined with threatening conſtitutional ſymptoms, have occurred. Our only deſign is to recommend the endeavour to cure the generality of compound luxations. But if a caſe were to preſent itſelf, attended with very great contuſion and laceration of the ſoft parts, we ſhould be as earneſt advocates for amputation as any practitioners.

The treatment of a compound diſlocation requires the reduction to be effected without delay, and with as little violence and diſturbance as poſſible. The limb is then to be placed in ſplints, with the requiſite pads, eighteen-tailed bandage, &c. The wound is to be freed from any dirt or extraneous matter, and its lips accurately brought into contact with ſtrips of adheſive plaſter. The joint is to be covered with linen wet with the ſaturnine lotion, the bandage is to be looſely laid down, and the ſplints faſtened on with their proper ſtraps or pieces of tape, and the limb is to be kept perfectly at reſt in an eligible poſture. The patient, if ſtrong and young, is to be bled. This laſt practice may be more freely adopted in the country than in London, or large hoſpitals. Purging, however, muſt never be omitted, and an anodyne, the firſt night or two, will be highly proper. Saline draughts, antimonials, and a low regimen, are alſo indicated during the firſt few days of the ſymptomatic fever which commonly follows ſo ſerious an accident.

If the caſe takes a favourable courſe, the conſtitutional indiſpoſition will not be exceſſive, nor will the pain and inflammation of the limb be immoderate. Sometimes the wound even unites, more or leſs, without ſuppuration, a circumſtance of the higheſt importance, as tending more than any thing to leſſen the danger, by changing the caſe, as it were, from a compound into a ſimple one. In other caſes, the wound is not united, but the inflammation and ſuppuration are not violent or extenſive, and there is every reaſon to expect ultimate ſucceſs. When the wound is diſpoſed to unite favourably, lint and adheſive plaſter are the beſt dreſſings. In other inſtances, while the ſuppuration is at all copious, or the inflammation high or extenſive, emollient poultices are moſt eligible.

When the ſymptomatic fever and firſt inflammatory ſymptoms are over, and there is much diſcharge, attended with marks of approaching weaking, the patient is to be allowed more food, and be directed to take bark, cordials, porter. wine, &c. If his nights are reſtleſs, he muſt have opiates; and, in ſhort, all ſuch medicines as his particular complaints may require, are to be preſcribed.

When the inflammation of a compound diſlocation is violent or extenſive, general bleeding, and the uſe of leeches, are the moſt effectual means of counteracting the miſchief.

In certain caſes, the moſt ſkilful treatment is unavailing. The joint and limb become affected with conſiderable pain and ſwelling; the fever runs high; delirium comes on; and the patient may even periſh from the violence of the firſt ſymptoms, the limb being generally at the ſame time attacked with gangrene. If theſe firſt dangers are avoided, the wound may not heal favourably; the inflammation may be extenſive; large abſceſſes under the faſciæ may be formed; and the hectical ſymptoms and ſinking ſtate of the patient may make the only chance of recovery depend upon amputation. But even this operation is ſometimes deferred till too late, and the patient muſt be left to his miſerable fate.

Whoever gives the ſmalleſt reflection to the nature of compound fractures, will perceive, that it is often a matter of the laſt importance to make a right deciſion at the very beginning, whether amputation ſhould be immediately done, or whether an attempt to ſave the limb ought to be made. In ſome inſtances, the patient's ſole chance depends upon the operation being performed at once without the leaſt delay, and the opportunity of doing it never returns.

Thus, when great inflammation and a rapid mortification of the limb follow the accident, the patient may die before the ſloughing has ſhewn the leaſt inclination to ſtop.

But, beſides this firſt critical period, the ſurgeon often has to exerciſe a nice degree of judgment in a future ſtage of the caſe; we mean when the ſuppuration is copious, and the health much impaired. Here the practitioner may err in taking off a limb that might be ſaved; or he may commit a worſe fault, and make the patient loſe his life in a fruitleſs attempt to ſave the member. No precepts can form the right practitioner in this delicate part of ſurgery; genius alone cannot do it; we would add, mere experience, however great, cannot do it: the opportunity of making obſervations, and the talent of profiting by them, are here the things which make the conſummate ſurgeon.

LUXEMBOURG, Francis Henry de Montmorency, *Duke of*, in *Biography*, a celebrated French general, ſon of the count of Boutteville, who was beheaded under Lewis XIII. for fighting a duel, was born in 1628. He was educated for the military profeſſion, and at the age of fifteen was, at the battle of Rocroi, under the illuſtrious Condè, whoſe various fortunes he followed. He reſembled that hero in ſeveral of his qualities, and was himſelf admitted a duke and peer of France. In 1667, he was promoted to a lieutenant-generalſhip, and in that character he was, in the following year, active in the conqueſt of Franche-Comtè. He had the chief command, in 1672, in the invaſion of Holland, where, in one campaign, he took a number of towns, and gained the battles of Bodegrave and Woerden: after this, he made a famous retreat with an army of 20,000 men, againſt 70,000. In 1675, he was oppoſed to the prince of Orange, and by his ſucceſs obtained the dignity of marſhal of France. In 1690, he gained the battle of Fleurus, which was followed by ſeveral other very important victories. Previouſly to theſe laſt-named ſucceſſes he had been detained a priſoner in the Baſtile more than a year, on charges connected with his amours, to which, notwithſtanding the deformity of his perſon and features, he was much addicted. He died in 1695, and with him, it has been ſaid, terminated the victories and grandeur of Lewis XIV. No general after him poſſeſſed, to ſo high a degree, the attachment and confidence of the ſoldiers. His uniform ſucceſs, when contending with king William, rendered him an object of jealouſy to that prince, who once, in the bitterneſs of his heart, called him a "hump-back;" "What does he know of my back," ſaid the marſhall, "he never ſaw it?" Moreri.

LUXEMBURG, in *Geography*, one of the ten Catholic provinces of the Netherlands before the French revolution, bounded on the north by the biſhopric of Liege, and duchies of Limburgh and Juliers, on the E. by the electorate of Treves, and on the S. and W. by France; to which, by a late treaty, it is now annexed, conſtituting, in part, the department of the *Forêts;* which ſee. It lies in the centre of the foreſt of Ardennes. Its ſoil, though not fertile, produces ſome corn; but it furniſhes a good breed of cattle, wine, all ſorts of game, iron-works, and founderies for cannon, which are the chief ſource of its wealth. It is watered by many ſmall rivers which run into the Meuſe and Moſelle. It contains, beſides the city of Luxemburg, 23 other ſmaller towns.

Luxemburg, a city of France, principal place of a diſtrict, and capital of the department of the Forêts. From being a caſtle, built by the people of Treves, it was enlarged by the Romans, and called "Auguſta Romanorum." When Merovinus, king of France, conquered the country, it was called the "city of the ſun," becauſe the ſun was anciently adored there, as the moon was at Arlon, Jupiter at Ivoy, now called Carignan, and Mars at Marche en Famine. This city is ſmall, but ſtrong, on account both of its ſituation and fortifications, which were thought to be the ſtrongeſt in Europe. It is divided by the river Alſitz, which runs through it, into the Upper and Lower Towns; the former being ſituated on a rock, the latter in a plain. Its number of inhabitants is eſtimated at about 10,000, its two cantons contain 20,522, on a territory of 247½ kiliometres, in 14 communes. Having frequently changed maſters, being at one time in the poſſeſſion of France, at another time in that of Spain, again under the dominion of the States-General, to which it was ceded by the barrier treaty in 1701, and afterwards, *viz.* in 1715, poſſeſſed by the emperor; it was blockaded by the French, after they had acquired by arms the ſurrounding country, and ſurrendered to them on the 7th of June, 1795, by capitulation. The ſurrender of Luxemburg put the French in poſſeſſion of the whole country on the left of the Rhine, except Mentz; 50 miles S.S.E. of Liege. N. lat. 49° 40′. E. long. 6° 13′.

LUXEUIL, a town of France, in the department of the Upper Saône, and chief place of a canton, in the diſtrict of Lure; 14 miles N.E. of Veſoul. The place contains 3080, and the canton 13,261 inhabitants, on a territory of 190 kiliometres, in 27 communes. N. lat. 47° 49′. E. long. 6° 27′.

LUXOR, Luxorein, or *Akſor*, a village of Egypt, on the right ſide of the Nile, the ſcite of which is the ruins of the celebrated city of *Thebes*, which ſee. Of theſe ruins we ſhall now only mention from Mr. Browne's Travels (p. 135.), that they extend for about three leagues in length along the Nile. Eaſt and weſt they reach to the mountains, a breadth of about 2½ leagues. The river is here about 300 yards broad. The circumference of the ancient city muſt, therefore, have been about 27 miles. This ingenious traveller is of opinion that Luxor and Akſor are corruptions of El Kuſſur, the real term, which is ſtill applied to the ruins by the Arabs; 18 miles S. of Kous.

LUXURIANT Plants, a term in *Gardening*, ſignifying ſuch as become greatly augmented in growth beyond their common natural ſtate, and which rarely acquire that degree of perfection which is the caſe with thoſe of more moderate growths. This ſometimes happens from the exceſs of nouriſhment, and ſometimes from the nature of the plants.

But it is produced differently; ſometimes prevailing in the whole plant, ſometimes in particular parts, as in ſome of the ſhoots, and frequently in the flowers.

The firſt of theſe may be conſidered ſuch as ſhoot much ſtronger than plants of the ſame ſpecies generally do, and it happens both in herbaceous plants and trees, &c. which never attain perfection ſo ſoon as the more moderate growers: thus, many ſorts of eſculent plants, which ſhoot luxuriantly to leaves and ſtalks, &c. as cucumbers, melons, cabbages, cauliflowers, turnips, radiſhes, beans, peas, &c. never arrive ſo ſoon to perfection as thoſe of moderate growth; and ſuch plants as appear to be naturally of themſelves of a very luxuriant nature, are very improper to ſtand, from which to ſave ſeed for future increaſe.

And this is alſo the caſe in fruit-trees; as ſuch as are very luxuriant ſhooters are much longer before they attain a bearing ſtate than thoſe of middling growth, and they never bear ſo plentifully, or have the fruit attain ſuch perfection. This luxuriance is frequently acquired by unſkilful pruning, eſpecially in wall-trees, &c. as it is often the practice, when wall or eſpalier trees aſſume ſuch a growth, to cut all the ſhoots ſhort; by which, inſtead of reducing the tree to a moderate ſtate of ſhooting, it has its vigour increaſed, as too conſiderable ſhortening of ſtrong ſhoots promotes their throwing out ſtill ſtronger, and producing more abundant or ſuperfluous wood. Therefore, in pruning very luxuriant eſpalier and wall-fruit trees, they ſhould be aſſiſted ſomewhat in their own way, as it were, by training in plenty of ſhoots annually for a year or two, to divide the redundancy of ſap; or, in the ſummer and winter prunings, always leaving them rather thicker than in the common practice, and moſtly at full length, unleſs it be neceſſary to ſhorten ſuch as are of very conſiderable length, or in ſome particular part of the tree, to force out a ſupply of wood to fill a vacancy. Some ſorts of fruit-trees ſhould, indeed, never be generally ſhortened in the common courſe of pruning, except in caſual, very extended, irregular growths, or occaſionally for procuring a ſupply of wood, as mentioned above. This is particularly neceſſary in apples, pears, plums, cherries, and fig-trees; for, if generally ſhortening was to be practiſed in theſe ſorts, they would continue ſhooting every year ſo luxuriantly to wood, that they would never form themſelves into a proper bearing ſtate: even in thoſe trees where ſhortening is neceſſarily practiſed in winter, in moſt of the annual ſupplies of ſhoots, as in peaches, nectarines, &c. in caſes of luxuriant growth, it ſhould be very ſparingly performed, the general ſhoots not being cut very ſhort, and ſome of the moſt vigorous left almoſt or quite at the full length. This is the proper method to reduce luxuriant trees to a moderate growth, and to a bearing ſtate; as by training the ſhoots thicker, and leaving them longer, and continuing it for a year or two, the redundant ſap, having greater ſcope to divide itſelf, cannot break out with that luxuriance as when it has not half the quantity of wood to ſupply with nouriſhment, as in the caſe of ſhort pruning. See ESPALIER, WALL-TREES, and PRUNING.

This ſtate ſeldom occurs with any continuance in ſtandard-trees, where permitted to take their natural growth, except in caſual ſtraggling ſhoots, which ſhould always be taken out. Over-luxuriant ſhoots are moſtly met with in trees and ſhrubs; but require more particularly to be attended to in the culture of the fruit-tree kind, eſpecially thoſe of the wall and eſpalier ſort, which undergo annual pruning.

They are ſuch as ſhoot ſo vigorouſly in length and ſubſtance, as greatly to exceed the general growth of thoſe uſually produced on the ſame kind of plant or tree, and are ſometimes general, but in other caſes only happen to particular ſhoots in different parts of a tree, &c. They are diſcoverable by their extraordinary length and thickneſs, and by their vigour of growth, which always greatly impoveriſhes the other more moderate ſhoots in their neighbourhood, and likewiſe the fruit, &c. as well as often occaſions a very irregular growth in the reſpective trees. Such ſhoots frequently occur in wall and eſpalier fruit-trees, and are the effects of injudicious pruning. When they are in general wholly ſo, they ſhould be managed as directed above; but when only in particular ſhoots here and there in a fruit tree, or other tree or ſhrub under training, ſuch ſhoots being of ſuch a very luxuriant nature as to draw away the nouriſhment, at the expence of the adjacent moderate ſhoots, and which, by their vigorous irregular growth, cannot be trained with any degree of regularity; they ſhould for the moſt part, as ſoon as diſcoverable, in the ſummer or winter prunings, be cut out, taking them off as cloſe as poſſible to the part of the branch whence they originate, that no eye may be left to ſhoot again; unleſs ſuch a ſhoot ſhould riſe in any part of a tree or ſhrub, where a further ſupply of wood may be requiſite; in which caſe it may be retained and ſhortened as convenient, to force out a ſupply of more ſhoots laterally to fill the vacancy.

Where it prevails in other trees and ſhrubs than thoſe of the fruit kind, they ſhould have occaſional attention, pruning them in regular order in their younger advancing growth, or afterwards occaſionally in particular ſorts, as may be neceſſary: obſerving, in either, when any ſtraggling ſhoots, &c. aſſume a very luxuriant rambling growth, greatly exceeding the other general branches, that they may be more or leſs reduced or cut entirely away cloſe to their origin, as may be moſt expedient, according to the nature of growth of the trees or ſhrubs, either in ſummer or winter, &c.

Moſt double flowers may be conſidered as luxuriant, eſpecially ſuch as have the cup or corolla multiplied, or ſo augmented in the number of their leaves or flower-petals inward, as to exclude ſome part of the fructification, as the ſame thing occurs in flowers as in eſculent plants and fruit-trees, from their over-luxuriant growth; for, as the flower is deſigned for perfecting the fruit and ſeed, when the petals are multiplied to the diminution of the ſtamina, &c. no impregnation enſues, and of courſe no fruit or ſeed is produced.

In the double varieties of moſt kinds of flowers produced on ornamental flowering plants, this luxuriance is generally conſidered as a ſuperior degree of perfection; and has different modifications.

The higheſt degree of this ſort of luxuriance is met with in carnations, anemones, ranunculuſes, the poppy, lychnis, peony, narciſſus, violet, and ſome others.

LUXURY, ſays Mr. Hume, (Eſſ. vol. i. p. 285.) is a word of an uncertain ſignification, and may be taken in a good as well as a bad ſenſe. In general, it means great refinement in the gratification of the ſenſes; and any degree of it may be innocent or blameable, according to the age, or country, or condition of the perſon. The bounds between the virtue and the vice cannot here be exactly fixed, more than in other moral ſubjects. To imagine, that the gratifying of any ſenſe, or the indulging of any delicacy in meat, drink, or apparel, is of itſelf a vice, can never enter into a head, that is not diſordered by the frenzies of enthuſiaſm. "I have, indeed," ſays our author, "heard of a monk abroad, who, becauſe the windows of his cell opened upon a noble proſpect, made a *covenant with his eyes* never to turn that way, or receive ſo ſenſual a gratification." Such is the crime of drinking Champagne or Burgundy, preferably to ſmall beer or porter. Theſe indulgences are only vices, when they are purſued at the expence of ſome virtue, as liberality or charity; in like manner as they are follies, when for them a man ruins his fortune, and reduces himſelf to want and beggary. When they entrench upon no virtue, but leave ample ſubject whence to provide for friends, family, and every proper object of generoſity or compaſſion, they are entirely innocent, and have in every age been acknowledged ſuch by almoſt all moraliſts. To be entirely occupied with the luxury of the table, for inſtance, without any reliſh for the pleaſures of ambition, ſtudy, or converſation, is a mark of ſtupidity, and is incompatible with any vigour of temper or genius. To confine one's expence entirely to ſuch a gratification, without regard to friends or family, is an indication of a heart deſtitute of humanity or benevolence. But if a man reſerve time ſufficient for all laudable purſuits, and money ſufficient for all generous purpoſes, he is free from every ſhadow of blame or reproach. Since luxury may be conſidered either as innocent or blameable, one may be ſurpriſed, ſays Mr. Hume, at thoſe prepoſterous opinions which have been entertained concerning it; while men of libertine principles beſtow praiſes even on vicious luxury, and repreſent it as highly advantageous to ſociety; and on the other hand, men of pure morals blame even the moſt innocent luxury, and repreſent it as the ſource of all the corruption, diſorders, and factions incident to civil government. This author endeavours to correct both theſe extremes, by proving, 1ſt, that the ages of refinement are both the happieſt and the moſt virtuous; and 2dly, that wherever luxury ceaſes to be innocent, it alſo ceaſes to be beneficial; and when carried a degree too far, is a quality pernicious, though perhaps not the moſt pernicious to political ſociety. In proof of the firſt point he conſiders the effects of refinement both on *private* and *public* life. For his reaſoning we muſt refer to the Eſſay, above cited. Induſtry, knowledge, and humanity, ſays our author, are linked together by an indiſſoluble chain, and are found, from experience as well as reaſon, to be peculiar to the more poliſhed, and, what are commonly denominated, the more luxurious ages. He adds, that theſe advantages are not attended with any diſadvantages that bear any proportion to them. The more men refine upon pleaſure, the leſs will they indulge in exceſſes of any kind; becauſe nothing is more deſtructive to true pleaſure than ſuch exceſſes. Beſides, induſtry, knowledge, and humanity diffuſe their beneficial influence beyond the ſphere of *private* life, on the *public*, and render the government as great and flouriſhing as they make individuals proſperous and happy. Our author concludes his Eſſay on "Refinement in the Arts," with the following obſervations. "Luxury, when exceſſive, is the ſource of many ills; but is in general preferable to ſloth and idleneſs, which would commonly ſucceed in its place, and are more hurtful both to private perſons and to the public. When ſloth reigns, a mean uncultivated way of life prevails amongſt individuals, without ſociety, without enjoyment. And if the ſovereign, in ſuch a ſituation, demands the ſervice of his ſubjects, the labour of the ſtate ſuffices only to furniſh the neceſſaries of life to the labourers, and can afford nothing to thoſe who are employed in the public ſervice."

An excellent writer, to whom we ſhall next refer, takes occaſion, from a conſideration of the mode of living which actually obtains in any country, to illuſtrate the true evil and proper danger of luxury. Luxury, as it ſupplies employment and promotes induſtry, aſſiſts population. But it is attended with a conſequence, which counteracts and often overbalances theſe advantages. When, by introducing more ſuperfluities into general reception, luxury has rendered the uſual accommodations of life more expenſive, artificial, and elaborate; the difficulty of maintaining a family, conformbly with the eſtabliſhed mode of living, becomes greater, and what each man has to ſpare from his perſonal conſumption proportionably leſs: the effect of which is, that marriages become leſs frequent, agreeably to the maxim, which lies at the foundation of this reaſoning, that men will not marry to *ſink* their place or condition in ſociety, or to forego thoſe indulgences, which their own habits, or what they obſerve amongſt their equals, have rendered neceſſary to their ſatisfaction. This principle is applicable to every article of diet and dreſs, to houſes, furniture, and attendance; and this effect will be felt in every claſs of the community. For inſtance, the cuſtom of wearing broad cloth and fine linen repays the ſhepherd and flax-grower, feeds the manufacturer, enriches the merchant, gives not only ſupport but exiſtence to multitudes of families: hitherto, therefore, the effects are beneficial: and were theſe the only effects, ſuch elegancies, or, if they may be ſo called, ſuch luxuries, could not be too general. But here follows the miſchief: when once faſhion hath annexed the uſe of theſe articles of dreſs to any certain claſs, to the middling ranks, for example, of the community, each individual of that rank finds them to be *neceſſaries* of life; that is, finds himſelf obliged to comply with the example of his equals, and to maintain that appearance which the cuſtom of ſociety requires. This obligation creates ſuch a demand upon his income, and withal adds ſo much to the coſt and burthen of a family, as to put it out of his power to marry, with the proſpect of continuing his habits or of maintaining his place and ſituation in the world. We ſee, in this deſcription, ſays our author, the cauſe which induces men to waſte their lives in a barren celibacy; and this cauſe, which impairs the very ſource of population, is juſtly placed to the account of luxury. It appears, upon the whole, to be the tendency of luxury to diminiſh marriages, and that in this tendency the evil of it reſides. Hence it may be inferred, that of different kinds of luxury, thoſe are the moſt innocent which afford employment to the greateſt number of artiſts and manufacturers; as thoſe, in other words, in which the price of the work bears the greateſt proportion to that of the raw material. Thus, luxury in dreſs, in furniture, is univerſally preferable to luxury in eating, becauſe the articles which conſtitute the one, are more the production of human art and induſtry, than thoſe which ſupply the other. We may alſo conclude, that it is the *difference*, rather than the *degree*, of luxury, which is to be dreaded as a national evil. The miſchief of luxury conſiſts in the obſtruction that it forms to marriage. But, as it is only a ſmall part of the people in any country that is compoſed by thoſe of higher rank, the facility, or the difficulty, of ſupporting the expence of their ſtation, and the conſequent increaſe or diminution of marriages among them, will have but little influence on the ſtate of population. As long as the prevalence of luxury is confined to a few of elevated rank, much of the benefit is felt, and little of the inconvenience. But when the imitation of the ſame manners deſcends, as it always will do, into the maſs of the people; when it advances the requiſites of living beyond what it adds to men's abilities to purchaſe them, then it is that luxury checks the formation of families, in a degree that ought to alarm the public. To all which we may add, that the condition moſt favourable to population is that of a laborious, frugal people, miniſtering to the demands of an opulent, luxurious nation; becauſe this ſituation, while it leaves them every advantage of luxury, exempts them from the evils which naturally accompany its admiſſion into any country. Paley's Princ. of Mor. and Pol. Philoſ. vol. ii.

In our country there was formerly a multitude of penal laws intended for reſtraining exceſs in apparel; chiefly made in the reigns of Edward III., Edward IV., and Henry VIII., againſt piked ſhoes, ſhort doublets, and long coats, all of which were repealed by ſtatute 1 Jac. I. c. 25. Exceſs of diet, which is one ſpecies of luxury, is ſtill prohibited by 10 Edward III. ſtat. 3, which ordains that no man ſhall be ſerved at dinner or ſupper with more than two courſes: except upon ſome great holidays there ſpecified, in which he may be ſerved with three. See Sumptuary *Laws*.

LUYTS, John, in *Biography*, a philoſopher and aſtronomer, was born in North Holland in 1665. He became profeſſor of philoſophy and mathematics at Utrecht, where he died in 1721. He wrote 1. An Aſtronomical Work, in which he rejected the Copernican ſyſtem, entitled "Inſtitutio aſtronomica in qua doctrina ſphærica, atque theorica, intermixto uſu ſphæræ cœleſtis, et variis chronologicis, pertractantur." 2. An Introduction to Modern and Ancient Geography, with many plates. In all that he wrote and taught he ſhewed himſelf a great partiſan of the Ariſtotelian philoſophy, in oppoſition to that of Deſcartes. Moreri.

LUZ, La, in *Geography*, a ſea-port town of the iſland of Canary; five miles N. of Civdad de los Palmas.—Alſo, a town of France, in the department of the Higher Pyrenées, and chief place of a canton, in the diſtrict of Argeles. The place contains 2135, and the canton 6222 inhabitants, on a territory of 552½ kiliometres, in 17 communes.

LUZARA, a town of Italy, in the department of Mincio; 16 miles S. of Mantua.

LUZARCHES, a town of France, in the department of the Seine and Oiſe, and chief place of a canton, in the diſtrict of Pontoiſe; 5 leagues N. of Paris. The place contains 1696, and the canton 11,411 inhabitants, on a territory of 180 kiliometres, in 22 communes. N. lat. 49° 7′. E. long. 2° 30′.

LUZECH, a town of France, in the department of the Lot, and chief place of a canton, in the diſtrict of Cahors; 2½ leagues from Cahors. The place contains 2049, and the canton 10,504 inhabitants, on a territory of 162½ kiliometres, in 12 communes. N. lat. 44° 29′. E. long. 1° 23′.

LUZERATH, a town of France, in the department of the Rhine and Moſelle, and chief place of a canton, in the diſtrict of Coblentz. The place contains 614, and the canton 2525 inhabitants, in 12 communes.

LUZERNE, a large county of Pennſylvania, bounded north by Tioga county in New York, eaſt and ſouth-eaſt by Northampton, weſt by Lycoming and Northumberland counties; about 79 miles in length from north to ſouth, and 75 in breadth from eaſt to weſt, divided into 19 townſhips, and containing 2 churches, 33 ſaw-mills, 24 griſt-mills, 2 fulling-mills, and 1 oil-mill. The number of inhabitants is 12,839. Near the Suſquehannah river, which, with its tributary ſtreams, well waters it, the ſoil is very fertile, and produces good crops of wheat, flax, and hemp. The northern parts abound with pine, timber, and ſugar-maple. In the townſhips of Wilkſbarre, Kingſton, Exeter, and Plymouth, are large beds of coal. Coal and bog-iron are found in ſeveral places, and two forges have been erected. In this county are many remains of ancient fortifications, which are of an elliptical form, and covered with large white oak-trees. Its chief town is Wilkſbarre.

LUZIOLA, in *Botany*, Juſſ. 33. An annual Peruvian graſs, which Dombey took for a *Zizania*. It is deſcribed by Juſſieu as monœcious, without any calyx; the corolla of two valves, without awns. Male flowers in a looſe terminal ſpike. Stamens uſually eight, ſometimes nine or ten; anthers ſtalked. Female flowers panicled, inferior, much ſmaller. Styles two. Seed ovate, naked.

LUZULA, a genus eſtabliſhed by Decandolle in his edition of Lamarck's *Flore Françaiſe*, v. 3. 158; and adopted by Mr. R. Brown, Prodr. Nov. Holl. v. 1. 591. It conſiſts of ſuch Linnæan *Junci* as have a capſule of a ſingle cell, with only three ſeeds, as is the caſe with *J. campeſtris*, Linn. (Juncoides; Mich. Gen. 41. t. 31.) Whether the ſmall number of the ſeeds be a ſufficient character, ſeems to us at beſt doubtful, conſidering how various their number is in other *Junci*. The capſule having one cell or three is certainly of no importance, in either the three-ſeeded or many-ſeeded ſpecies; ſome having perfect partitions from the centre of their valves, others more or leſs of a ridge there in the place of them. The capſule of *Juncus Forſteri*, Engl. Bot. t. 1293, for inſtance, which by the number of its ſeeds ſhould be a *Luzula*, has a capſule of three cells. It is indeed much to be wiſhed, that plants ſo unlike the habit of moſt *Junci* could, by any ſound character, be ſeparated from them; but without ſuch they are beſt as they are.

LUZURIAGA, ſo called by the authors of the Flora Peruviana, in honour of a Spaniſh botaniſt, or patron of the ſcience, of the ſame name. Ruiz et Pavon Fl. Peruv. Brown Prodr. Nov. Holl. v. 1. 281.—Claſs and order, *Hexandria Monogynia*. Nat. Ord. *Sarmentaceæ*, Linn. *Aſphodeli*, Juſſ. *Aſphodeleæ*, Brown.

Eſſ. Ch. Calyx none. Corolla in ſix deep, equal, ſpreading, beardleſs ſegments, deciduous. Filaments inſerted into the baſe of each ſegment, thread-ſhaped, ſmooth, curved at the point; anthers arrow-ſhaped, cohering, longer than the filaments. Style thread-ſhaped, with three furrows; ſtigma ſimple. Berry with a few, nearly globoſe, ſeeds.

This genus conſiſts of climbing weak ſhrubs, with ſimple ribbed leaves. Flowers cymoſe or umbellate, terminal and axillary; their footſtalks as it were articulated with the rather tapering baſe of the flower. Berry black, ſometimes encloſing only a ſingle ſeed. Mr. Brown is not quite certain of his genus being preciſely the ſame with that of the Flora Peruviana. He defines two New Holland ſpecies.

1. L. *cymoſa*. Cymes terminal, deeply divided. Branches round. Young branches ſtriated, ſmooth. Found near Port Jackſon, as well as within the tropic.

2. L. *montana*. Umbels axillary, ſtalked. Branches ſtriated, rough. Found near Port Jackſon.

LUZY, in *Geography*, a town of France, in the department of the Nièvre, and chief place of a canton, in the diſtrict of Chateau-Chinon; 5 leagues S.S.E. of Moulins-en-Gilbert. The place contains 1607, and the canton 8748 inhabitants, on a territory of 417½ kiliometres, in 9 communes.

LUZZANA, a town of Italy; 22 miles S. of Mantua.

LUZZI, a town of Naples, in Calabria Citra; 4 miles S. of Biſignano.

LUZZO Marino, in *Ichthyology*, a name given by the Italians to the fiſh called by the ancient Greek writers, and many of the modern Latin authors, *ſphyræna*; and by Pliny, Varro, and ſome other of the old Roman authors, *ſudis*. Gaza has called it the *malleolus*, and the French, at this time, call it *ſpet*. Salvian has given the figure of it, but it is an imperfect one; for he has omitted the firſt fin of the back.

LYBIA, in *Ancient Geography*. See Libya.

LYCÆA, Λυκαια, in *Antiquity*, an Arcadian feſtival reſembling the Roman *lupercalia*, in which the conqueror was rewarded with a ſuit of brazen armour.

LYCANTHROPIA, in *Ancient Medicine*, from λυκος, *a wolf*, and ανθρωπος, *man*, as it were *man-wolf*, a term applied to that variety of inſanity or melancholy, which induced the perſons affected to wander out in the night, howling and making other noiſes, frequenting church-yards, or places of burial; in which circumſtances they were ſuppoſed to imitate or to reſemble wolves. Aëtius and Paul of Ægina have deſcribed ſuch patients as pale, with dry and hollow eyes, parched tongue and mouth, exceſſive thirſt, and perpetual ſores on their legs, in conſequence of the frequent accidents which they met with. The ſame term was alſo applied to thoſe maniacs, who fancied themſelves transformed into wolves. The appellation of *cynanthropia* was alſo given to the diſeaſe, when the patients imitated the manners of *dogs*, or imagined themſelves to be changed into theſe animals.

LYCAON, in *Zoology*. See *Black* Fox.

LYCAONIA, in *Ancient Geography*, a province of Aſia Minor, ſouth of Galatia. According to Strabo, Iſauria made a part of it. It was ſituated between mountains, and is ſuppoſed to have derived its name from λυκος, *a wolf*, becauſe the country, from its ſituation, formed a proper retreat for thoſe animals. The principal places of Lycaonia, according to Ptolemy, were Adopiſſus Canna, Iconium, Paralais Corna, Caſbia, and Baratta. The apoſtles of this country are ſaid to have been St. Paul and St. Barnabas. The notitia of Hierocles reckons in this province 18 epiſcopal towns.

LYCEUM, Λυκειον, in *Antiquity*, the name of a celebrated ſchool, or academy at Athens, where Ariſtotle explained his philoſophy.

The place was a grove in the ſuburbs of Athens, which had previouſly been uſed for military exerciſes. It was compoſed of porticoes, and trees planted in the quincunx form, where the philoſophers diſputed walking. Hence *philoſophy of the Lyceum* is uſed to ſignify the philoſophy of Ariſtotle, or the Peripatetic philoſophy. Suidas obſerves, that the Lyceum took its name from its having been originally a temple of Apollo Lyceus; or rather, a portico or gallery built by Lyceus, ſon of Apollo: but others mention it to have been built by Piſiſtratus, or Pericles. Here he delivered his lectures to a promiſcuous auditory in the evening, when the Lyceum was open to all young men without diſtinction; but in the morning his diſciples were more ſelect, and ſuch as had been previouſly inſtructed in the elements of learning, and diſcovered abilities and diſpoſitions ſuited to the ſtudy of philoſophy. The latter he called his morning walk, and the former his evening walk. Ariſtotle continued his ſchool in the Lyceum twelve years.

LYCHNANTHUS, in *Botany*, a name given by Gmelin to the *Cucubalus baccifer* of Linnæus, which is ſuperfluous, this plant being perhaps the only true *Cucubalus*; ſee that article.

LYCHNIDEA. See PHLOX and SELAGO.

LYCHNIS, λυχνις; of the Greeks, which word alſo ſignifies a lamp. Hence ſome have ſuppoſed that its botanical application aroſe from the down of the plant having been uſed to make wicks for lamps. This, however, by no means appears to have been the fact. The moſt probable and apparent explanation of the name is from the reſemblance of the calyx to a lanthorn, its ſides being ſemi-tranſparent between the ribs or veins, or the whole, in ſome inſtances, quite membranous, round, and inflated, like the horn lanthorns ſtill uſed by the Chineſe. Poſſibly the appearance of the ſtigmas, ſtamens, or crown of the corolla, in ſeveral ſpecies, might favour the idea of a lamp with its flame. We muſt recollect that this name of *Lychnis* has been always uſed, with great latitude, for all the Campion tribe, by the old botaniſts; though now reſtricted, by Linnæus and his followers, to one particular genus of that family. The ſhort mention in Dioſcorides, of his λυχνις, is quite inſufficient to determine either the wild or garden plant of which he ſpeaks. Linn. Gen. 231. Schreb. 312 Willd. Sp. Pl. v. 2. 807. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 493. Ait. Hort. Kew. ed. 2. v. 3. 132. Juſſ. 302. Lamarck Illuſtr. t. 391. Gærtn. t. 130.—Claſs and order, *Decandria Pentagynia*. Nat. Ord. *Caryophyllei*, Linn. Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, oblong, tubular, membranous, five-toothed, permanent. *Cor.* Petals five; their claws the length of the calyx, flat, each crowned with a double erect ſcale; border flat, wedge-ſhaped, often divided. *Stam.* Filaments ten, longer than the calyx, fixed to the claws of the petals, five alternate ones later than the reſt; anthers incumbent. *Piſt.* Germen ſuperior, nearly ovate; ſtyles five, awl-ſhaped, longer than the ſtamens; ſtigmas downy, reflexed contrary to the motion of the ſun. *Peric.* Capſule more or leſs ovate, clothed with the calyx, of from one to five cells, opening by five rigid reflexed teeth at the top. *Seeds* numerous, roughiſh, ſomewhat kidney-ſhaped.

Obſ. L. *dioica* has the ſtamens and piſtils in ſeparate flowers and on different plants. *L. Viſcaria* has undivided petals, and a capſule of five cells. Some other ſpecies are eſteemed to vary in the number of their ſtyles from five to four, or even three. *L. apetala* has the corolla concealed within the calyx.

Eſſ. Ch. Calyx of one leaf, oblong. Petals five, with claws; the border uſually divided. Capſule ſuperior, with five teeth at its orifice, of from one to five cells.

Ten ſpecies of *Lychnis* occur in the fourteenth edition of *Syſt. Veg.*, of which one, *alpeſtris* of the *Supplementum*, is made by Jacquin, Aiton, and Willdenow, a *Silene*, ſurely with great propriety. But there can be no doubt that *quadridentata* ought to be referred to the ſame genus, as having naturally only three ſtyles, or at moſt but four. Theſe two ſpecies being removed hence, the above-mentioned anomaly in the number of the ſtyles in the preſent genus is done away; for *alpina*, reputed to have four ſtyles, is now known to have naturally, if not invariably, five; ſee Engl. Bot. t. 2254. We therefore retain but eight of the ſpecies of Linnæus, or rather of Murray, for Linnæus was originally correct reſpecting the above. To theſe eight two are added by Willdenow, from Aiton and Lamarck.

1. L. *chalcedonica.* Scarlet Lychnis. Linn. Sp. Pl. 625. Curt. Mag. t. 257. Ger. em. 466.—Tufts terminal, level-topped, many-flowered. Leaves ovate, rough, ſomewhat undulated.—This is ſaid by Gmelin to grow wild in all parts of Ruſſia and Siberia. It is one of the oldeſt ornaments of our flower-gardens, being a hardy perennial, very ſhowy, and remarkable for the rich deep ſcarlet of its bloſſoms, eſpecially when double. Theſe appear in June and July, forming a large, denſe, convex, terminal tuft, two or three inches wide. The *ſtem* is three or four feet high, round, hairy, leafy, but little branched. *Leaves* ſeſſile, oppoſite, pointed, wavy, rough, dark green, claſping the ſtem with their broad, ovate, often combined, baſes. We have never ſeen the pale red, nor the white varieties, mentioned by authors.

2. L. *Flos cuculi.* Meadow Lychnis, or Ragged Robin. Linn. Sp. Pl. 625. Curt. Lond. faſc. 1. t. 33. Engl. Bot. t. 573. (Armoraria pratenſis; Ger. em. 600.)—Petals in four deep, linear ſegments. Leaves lanceolate, ſmooth. Fruit roundiſh, of one cell.—Frequent in moiſt meadows throughout Europe, flowering in June. The *root* is perennial. *Stem* twelve or eighteen inches high, with rough angles, viſcid above. *Leaves* narrow. *Panicle* forked. *Petals* pink, very delicate, with a brown, angular, ſmooth calyx. There is a double variety, and ſome mention a white one.

3. L. *Viſcaria.* Red German Catchfly. Linn. Sp. Pl. 625. Fl. Dan. t. 1032. Engl. Bot. t. 788. (Muſcipula anguſtifolia; Ger. em. 601.)—Petals undivided. Leaves linear-lanceolate, ſmooth. Fruit of five cells.—Native of dry or rocky paſtures in the north of Europe. We have gathered it in the fiſſures of rocks, a mile ſouth of Edinburgh, and have it alſo from Perthſhire. It flowers in May and June. A double variety is common in gardens, and a pure white one is ſometimes ſeen. The *roots* are woody, tufted, and perennial. *Herb* ſmooth. *Stem* a foot high, angular, brown and very clammy under each joint. *Leaves* narrow. *Flowers* in a denſe, forked, oblong bunch or ſpike. *Petals* crimſon, only ſlightly emarginate, not cut or cloven. *Capſule* ovate, of five cells, though this ſpecies is ſo nearly allied in habit to the foregoing, whoſe capſule has but one cell.

4. L. *alpina.* Red Alpine Campion. Linn. Sp. Pl. 626. Tour in Lapland, v. 2. 19. Curt. Mag. t. 394. Fl. Dan t. 65. Engl. Bot. t. 2254.—Smooth. Petals cloven. Flowers corymboſe. Leaves linear-lanceolate.—Native of the Lapland, Siberian, Swiſs and Pyrenean mountains; diſcovered on the Clova mountains of Anguſhire, by Mr. G. Don, in 1795. It is much ſmaller than the laſt, and not at all viſcid. The *petals* are divided at leaſt half way down, and their crown is but ſmall. See Sm. Tr. of Linn. Soc. v. 10. 342, for the confuſion and contrariety of deſcription which has attended this ſpecies.

5. L. *magellanica.* Magellanic Campion. Lamarck Dict. v. 3. 641. Willd. n. 7.—Somewhat hairy. Leaves linear. Petals cloven, ſcarcely longer than the calyx.—Fruit of one cell.—Gathered by Commerſon in the Straits of Magellan. We know this ſpecies ſolely by Lamarck's account. He compares its habit and foliage to that of Thrift, *Statice Armeria*, but obſerves that it is next akin to L. *alpina*, differing in having narrower, and ſomewhat downy *leaves*, fewer and

larger *flowers*, whoſe petals ſcarcely exceed the length of their bell-ſhaped calyx.

6. L. *ſibirica*. Siberian Campion. Linn. Sp. Pl. 626. —Hairy. Leaves lanceolate. Stem forked, many-flowered. Petals cloven, twice as long as the calyx. Fruit of one cell. —Gathered in Siberia by Gmelin, who ſent it to Linnæus, but it does not find a place in the *Flora Sibirica*. This has greatly the habit of *Silene alpeſtris* above-mentioned, but is all over hairy; the *petals* more obtuſe, and leſs deeply cloven; the *ſtyles* five. The *root* is very long and ſimple, tufted at the crown, bearing numerous *ſtems* a ſpan high, which are about twice forked. *Calyx* bell-ſhaped, tapering at the baſe. *Petals* apparently reddiſh. *Capſule* ovate, of one cell, with recurved irregular teeth.

7. L. *læta*. Small Portugal Campion. Ait. Hort. Kew. ed. 1. v. 2. 118.—"Petals cloven. Flowers ſolitary. Leaves linear-lanceolate, ſmooth. Calyx with ten ribs."—Brought from Portugal, by the late Dr. Edward Whittaker Gray, in 1778, to Kew garden, where it is ſaid to be a hardy annual, flowering in July. If this ſpecies ſtill exiſts, it ought to be figured in ſome periodical work; it being greatly to be wiſhed that the authors of ſuch would prefer unpubliſhed plants to thoſe already often delineated. We know of no plate of this or the laſt-mentioned.

8. L. *coronata*. Chineſe Lychnis. Thunb. Jap 187. Linn. Syſt. Veg. ed. 14. 435. Curt. Mag t. 223. (L. grandiflora; Jacq. Col. v. 1. 149. Ic. Rar. t. 84. Hedona ſinenſis; Lour. Cochinch. 286; ſee HEDONA.)—Leaves elliptic-lanceolate, ſmooth. Flowers axillary or terminal, ſolitary. Petals jagged.—Native of China and Japan, from whence Dr. Fothergill procured the plant in 1774. It flowers in June or July, or later, and muſt be kept in the greenhouſe in winter, or at leaſt protected by extraordinary covering, if left in the border. The *root* is perennial. *Stem* weak, round, ſmooth, two feet high. *Leaves* elliptic-lanceolate, pointed, ſmooth, pale beneath. *Flowers* remarkable for their great ſize, ſharply jagged petals, and red-lead, very vivid, colour.

9. L. *dioica*. Red or White Field Campion. Linn. Sp. Pl. 626.—α (red) Curt. Lond. faſc. 2. t. 32. Engl Bot. t. 1579.—β (white) Fl. Dan. t. 792. Engl. Bot. t. 1580. Leaves hairy. Flowers dioecious. Fruit of one cell. Crown of each petal four-cleft.—A very common plant throughout Europe; the red-flowered kind in hedges and ſhady buſhy places in ſpring; the white more uſually in fields or open ſituations in ſummer. The latter is a ſtronger plant, and from its evening fragrance has been called L. *veſpertina* by Dr. Sibthorp, while the former is his *diurna*; ſee Fl. Oxon. 145, 146. Both are uſually dioecious, but not invariably ſo. There is a bluſh-coloured variety, otherwiſe moſt like the white; but we have found it in cultivation ſoon evaneſcent. The *roots* of both are perennial. *Plant* hairy and ſomewhat viſcid, two or three feet high. *Stem* forked. *Leaves* ovate or lanceolate. *Limb* of each petal cloven half way down, generally with two ſmall acute lateral lobes, its crown moreover conſiſting of two obtuſe central teeth, and two acute lateral ones.

10. L. *apetala*. Apetalous Mountain Campion. Linn. Sp. Pl. 626. Fl. Lapp. ed. 2. 150. t. 12. f. 1.—Calyx inflated, longer than the petals. Stem nearly ſingle-flowered. —Native of the mountains of Lapland and Siberia. The *root* is perennial. *Stem*, in the Lapland ſpecimens, a ſpan high, and quite ſimple, ſingle-flowered; in ſome of Gmelin's, from Siberia, taller, with from three to five flowers. The whole *herb* is ſlightly downy. *Leaves* lanceolate, rather narrow. *Flower* drooping. *Calyx* ovate, cloſed, with ten rough, purpliſh-brown ribs. *Petals* ſmall and narrow, with an obſolete browniſh border, entirely included, along with the ſtamens and piſtil, in the hollow of the calyx. *Capſule* obtuſe, of one cell.

LYCHNIS, in *Gardening*, contains plants of the hardy, herbaceous, flowery, perennial kind, of which the ſpecies cultivated are the ſcarlet lychnis (L. chalcedonica); the red-flowered lychnis, meadow pink, or ragged robbin, (L. flos cuculi); the Chineſe lychnis (L. coronata); the viſcous lychnis, or catchfly, (L. viſcaria); the roſe-flowered lychnis, wild red campion, or red bachelor's buttons (L. diurna); and the white-flowered lychnis, wild white campion, or white bachelor's buttons, (L. veſpertina.)

In the firſt ſort there is a variety with very double flowers, of a beautiful ſcarlet colour, they are produced in cloſe cluſters, ſitting upon the top of the ſtalk; when the roots are ſtrong, the cluſters of flowers are very large, and make a fine appearance, coming out the latter end of June, and in moderate ſeaſons continue nearly a month in beauty.

Of the fifth ſort there is a variety with double flowers, cultivated in gardens by the name of red bachelor's buttons, which is an ornamental plant, and continues long in flower.

And the ſixth ſort has varieties with purple, or bluſh-coloured flowers; with quadrifid petals; with hermaphrodite flowers; with double flowers, cultivated in gardens by the name of double white bachelor's buttons.

Method of Culture.—They may be increaſed with facility in the ſingle ſorts by ſeed, and parting the roots; and in the double ones by dividing or ſlipping the roots; and ſometimes by cuttings of their ſtalks.

The ſeed ſhould be ſown in the early ſpring, as in March, in a bed or border of light earth, in an eaſtern aſpect, each ſort ſeparate, raking them in lightly, or they may be ſown in ſmall drills. The plants come up in two or three weeks, when they ſhould have occaſional waterings and hand-weedings: and when the plants are two or three inches high, be planted out in beds or borders, in rows ſix inches aſunder, watering them till freſh-rooted, letting them remain till the autumn or following ſpring, when they ſhould be tranſplanted where they are to remain.

Both the ſingle and double may be increaſed by ſlipping the roots, but it is more particularly applicable to the double ſort, as they cannot with certainty be obtained from ſeed: the ſeaſon for performing this work is the autumn after the ſtalks decay, when the whole root may either be taken up and divided into as many ſlips as are furniſhed with proper root-fibres, or the main root ſtand, and as many of the outer offsets as ſeem convenient to be ſlipped off: theſe ſlips, when ſtrong, ſhould be planted at once where they are to remain; but when rather ſmall and weak, it is better to plant them in nurſery rows, half a foot aſunder, to remain a year, and then tranſplant them for good where they are to ſtand.

The planting of cuttings of the ſtalks is moſtly practiſed for the double ſcarlet ſort, when it increaſes but ſparingly by offsets of the root. It is performed in ſummer, when the ſtalks are well advanced in growth, but before they flower, or have become hard and woody. Some of them ſhould be cut off cloſe to the bottom, and divided into lengths of four or five joints, planting them in an eaſterly border of rich, moiſt loamy earth, two thirds of their length into the ground, leaving only one joint or eye out, watering them directly, and repeating it occaſionally with neceſſary ſhade in hot weather. They will be well rooted, and form proper plants for tranſplanting in the autumn. If the cuttings, as ſoon as planted, are covered down cloſe with hand-glaſſes, it will greatly promote their rooting, ſo as to form ſtronger plants before the winter ſeaſon comes on.

The only culture they require afterwards is clearing them from weeds in ſummer, and ſupporting with ſtakes thoſe which need it, cutting down and clearing away the decayed ſtalks in the autumn.

Of the third ſort, as being rather more tender, ſome plants ſhould be planted in pots, for moving under the protection of a frame or greenhouſe in the winter ſeaſon.

All theſe plants are very ornamental for the pleaſure-ground, particularly the doubles, and proſper in any common ſoil, remaining in all weathers unhurt, being of many years duration in root; and, when of ſome ſtanding, ſend up many ſtalks every ſpring, terminated by numerous flowers, making a fine appearance in ſummer. The ſcarlet double lychnis claims the preference, though the ſingle ſcarlet ſort is alſo very ſhowy. And all the other ſpecies in their reſpective double-flowered ſtates are ornamental. They are all kept in the nurſeries for ſale. In planting out, the talleſt growers ſhould be placed the moſt backward, and the others more towards the front.

LYCHNITIS MARMOR. See MARBLE.

LYCIA, in *Ancient Geography*, a country of Aſia Minor, originally called Mylias, from the Mylliæ, a people of Crete, who ſettled there, and afterwards Lycia, from Lycus, the ſon of Pandion, king of Athens; ſituated upon the Mediterranean, and forming a kind of peninſula, on the weſt of which was the Glaucus Sinus, and on the eaſt another gulf, in the lower part of which was Attalea. To the ſouth was the Mediterranean. The adjacent countries were on the weſt, Caria, to the north a ſmall part of Phrygia Pacatiana, and to the north-eaſt Pamphylia. Its boundaries were various at different times. Ptolemy places in Lycia the countries called Mylias and Carbalia, or Cabalia. Pliny ſays that the Lycians had thirty-ſix towns; Strabo aſcribes to them twenty-three, of which ſix were very conſiderable. Lycia was interſected by ſeveral chains of mountains, paſſing from the north and north-eaſt, and extending towards the ſea. The moſt conſiderable rivers were the Xanthus and Limyrus. Its principal towns were Telmiſſus, Pinara, Xanthus, Patara, Myra, Limyra, Olympus, and Phaſelis. The ſix towns, particularly noticed by Strabo, after Artemidorus, were Xanthus, Patara, Pinara, Olympus, Myra, and Tlos. The chief mountains of Lycia were Taurus and Chimæra. In the firſt ages of Chriſtianity, Hierocles reckons as epiſcopal thirty towns, and Leon le Sage thirty-eight. The inhabitants of Lycia were originally from the iſland of Crete: and they were for a long time addicted to piracy. Diodorus Siculus, and Plato before him, reckon the Lycians among the Greek nations of Aſia, as being deſcended from the Argians. Although they were governed by kings, it does not appear that the government was completely monarchical; a confederacy having been formed by twenty-three cities, which ſent deputies to a general aſſembly, by which the affairs of the nation were managed. The ſoil of this country was fruitful, and the air reckoned very wholeſome. The Lycians are highly commended by the ancients for their ſobriety, and manner of adminiſtering juſtice. They continued to be governed by their own kings after they were ſubdued by the Perſians, paying them tribute. They afterwards fell with the Perſians under the power of the Macedonians, and after the death of Alexander, were governed by the Seleucidæ. When Antiochus the Great was confined by the Romans beyond mount Taurus, Lycia was granted to the Rhodians; but theſe diſobliging the Romans in the war with Perſeus, Lycia was declared a free country, and continued in this ſtate till the reign of Claudius, who, provoked at their inteſtine diſſentions, reduced their country into the form of a province.

LYCIUM, in *Botany*, λυκιον, of the Greeks, ſo called, as is generally ſuppoſed, from Lycia, its native country; but what was the preciſe plant intended, has never been ſettled by commentators. Dioſcorides deſcribes it as a "ſpinous tree, with twigs three cubits or more in length, bearing thick-ſet leaves, like box. The fruit is like pepper, black, thick-ſet, bitter, and ſmooth. Bark pale. Roots woody." This deſcription accords in many points with ſome ſpecies of the received *Lycium*, but with none, that we are acquainted with, in every point. Box-thorn. Linn. Gen. 103. Schreb. 136. Willd. Sp. Pl. v. 1. 1057. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2, 3. Sm. Prodr. Fl. Græc. Sibth. v. 1. 155. Juſſ. 126. Lamarck Illuſtr. t. 112. Gærtn. t. 132. (Jaſminoides; Mich. Gen. 224. t. 105. Duhamel Arb. v. 1. 305.)—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Luridæ*, Linn. *Solaneæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, ſmall, ſlightly five-cleft, obtuſe, erect, permanent. *Cor.* of one petal, funnel-ſhaped; tube cylindrical, ſpreading, incurved; limb ſmall, in five deep, obtuſe, ſpreading ſegments. *Stam.* Filaments five, awl-ſhaped, inſerted into the middle of the tube, and cloſing its orifice with their beard-like hairineſs, ſhorter than the limb; anthers erect. *Piſt.* Germen ſuperior, roundiſh; ſtyle ſimple, projecting beyond the ſtamens; ſtigma cloven, thickiſh. *Peric.* Berry roundiſh, of two cells. *Seeds* ſeveral, kidney-ſhaped. *Receptacles* convex, fixed on each ſide of the partition.

Eſſ. Ch. Corolla tubular; its orifice cloſed by the beards of the filaments. Berry of two cells, with many ſeeds.

The ſpecies of this genus have been very imperfectly explained in many of the works of Linnæus. The fourteenth edition of *Syſt. Veg.*, edited by Murray, contains eleven, of which the firſt and fifth are one and the ſame plant, no *Lycium* at all, but the *Seriſſa* of Juſſieu; ſee Willd. Sp. Pl. v. 1. 1061; ſee alſo our article DYSODA. The ſeventh and eighth alſo are but one ſpecies, *boerhaavifolium* of Linn. Suppl. and the eleventh, *capſulare* of Sp. Pl. 278, appears, by the Linnæan herbarium, to be a nondeſcript ſpecies of *Hydrolea*; called *glabra* in the Bankſian collection, where is the other half of the very ſame ſpecimen, of which a part was ſent to Linnæus by Miller, who received it from New Spain. Seven, therefore, only of the above number remain, to which three are added from Thunberg, in Willdenow. The latter, therefore, is correct in his enumeration, except with reſpect to the *capſulare*. But Thunberg has given more recent illuſtration of his own new ſpecies in the ninth volume of the Linnæan Society's Tranſactions, with plates. We ſhall briefly deſcribe the whole, with an additional ſpecies from Michaux.

1. L. *afrum*. African Box-thorn. Linn. Sp. Pl. 277. (L. foliis linearibus; Trew. Ehret. 4. t. 24. Jaſminoides aculeatum humile, halimi minoris folio, flore majori violaceo, fructu craſſiore, per maturitatem flaveſcente; Mich. Gen. 224. t. 105. f. 2.)—Leaves cluſtered, linear, tapering at the baſe. Branches ſtraight, ending in a ſpine.—Native of the north of Africa, and ſome parts of Spain. It has been long cultivated in the greenhouſes of the curious, but has little to attract general admiration. The *ſtem* is ſhrubby, rigid, much branched; each branch ending in a ſtiff ſtraight ſpine. *Leaves* linear, bluntiſh, entire, various in length and breadth, many together in lateral cluſters, ſmooth, rather glaucous and fleſhy. *Flowers* ſolitary, purple, about an inch long, drooping; on ſimple ſtalks, uſually twice or thrice as long as the calyx. Linnæus cites Micheli very

erroneouſly, which Willdenow, not turning to the book, has omitted to correct.

2. L. *rigidum.* Rigid Box-thorn. Thunb. Prodr. 37. Tr. of Linn. Soc. v. 9. 153. t. 14.—Leaves cluſtered, linear. Branches ſtraight, ending in a ſpine. Flowers nearly ſeſſile.—Gathered by Thunberg near Cape Town, flowering in July and Auguſt. It differs from the former chiefly in having the *flowers* nearly ſeſſile, with a much ſhorter and broader *corolla.* The *leaves* alſo are narrower.

3. L. *ruthenicum.* Tartarian Box-thorn. Murr. Comm. Gott. for 1779, p. 2. t. 2. Ehrh. Exſicc. n. 4. (L. tataricum; Pall. Roſſ. v. 1. faſc. 1. 78. t. 49.)—Leaves linear, cluſtered, from ſpinous buds. Branches elongated, pendulous.—Native of Siberia and Tartary. The *branches* are long, ſlender, pendulous, compound, with a pale ſmooth bark, and a ſolitary prominent ſpine from each bud. *Leaves* linear, bluntiſh, tapering at the baſe, ſcarcely more than three or four in each cluſter. *Flowers* drooping. *Corolla* funnel-ſhaped, about half an inch long, pale purple. *Calyx* ſomewhat two-lipped. This is ſmaller in all its parts than the following.

4. L. *barbarum.* Willow-leaved Box-thorn, or Blue Jaſmine. Linn. Sp. Pl. 277. Schkuhr. Handb. v. 1. 147. t. 46.—Leaves lanceolate, ſolitary or cluſtered, very unequal. Spines axillary. Branches elongated, pendulous.—Native of Europe, Aſia, and Africa, very hardy with us, and long cultivated for bowers and trelliſes, being a rambling ſhrub of very luxuriant growth, though no great beauty. Its *flowers* are purple. *Berries* of an orange-red. The Chineſe variety, diſtinguiſhed by gardeners, and figured by Duhamel, differs ſcarcely in any thing. The *calyx* is occaſionally three or five-cleft, and ſomewhat two-lipped, in that as well as the ordinary kind. This plant bloſſoms from May to the very end of autumn, bearing flowers and fruit together in abundance.

5. L. *tetrandrum.* Four-cleft Box-thorn. Thunb. Prodr. 37. Tr. of Linn. Soc. v. 9. 154. t. 15. Linn. Suppl. 150.—Leaves obovate, cluſtered. Branches ſtraight, angular, ending in a ſpine. Flowers four-cleft.—Native of the Cape of Good Hope, towards the ſea, flowering in June. *Thunb.* A rigid, branched, ſmooth *ſhrub,* with the habit of the firſt two ſpecies, but very ſmall, fleſhy, obovate *leaves,* and ſmall, funnel-ſhaped, ſhort, white *flowers,* whoſe *corolla* is four-cleft, and *ſtamens* four only.

6. L. *cinereum.* Grey-barked Box-thorn. Thunb. Prodr. 37. Tr. of Linn. Soc. v. 9. 154. t. 16.—Leaves lanceolate, cluſtered, nearly equal. Branches ending in a ſpine. Flowers on very ſhort ſtalks.—Found at the Cape of Good Hope by Thunberg. He deſcribes the *ſtem* as round, ſtriated, ſmooth, grey, much branched, zigzag, and erect; the *branches* alternate, ſlender, elongated, each terminating in a ſharp ſpine. *Leaves* ſmooth, acute. *Flowers* axillary, ſolitary, on ſtalks ſcarcely longer than the calyx, and not half the length of any of the leaves.

7. L. *horridum.* Succulent-leaved Box-thorn. Thunb. Prodr. 37. Tr. of Linn. Soc. v. 9. 154. t. 17.—Leaves obovate, fleſhy, ſmooth. Branches numerous, ending in a ſpine. Flowers on very ſhort ſtalks.—Grows in maritime ſituations at the Cape, flowering from September to November. *Thunb.* The *ſtem* is three feet high, rigid, abounding with ſhort ſpinous *branches* in every direction. *Leaves* from three to ſeven in a cluſter, not half an inch long, ſeſſile, thick, ſmooth; flattiſh and green above; convex, white, and marked with a green line, beneath. *Flowers* ſolitary, ſmall, on ſhort ſtalks. They are repreſented in the figure with four ſegments only, though of this nothing is ſaid in the character or deſcription. If it be correct, the preſent ſpecies comes very near the fifth.

8. L. *europæum.* European Box-thorn. Linn. Sp. Pl. ed. 1. 192. Mant. 47. (Jaſminoides aculeatum, ſalicis folio, flore parvo, ex albo purpuraſcente; Mich. Gen. 224. t. 105. f. 1.)—Leaves obovate, oblique, cluſtered. Spines lateral and terminal. Stem erect.—Native of the ſouth of Europe; hardy in our gardens, flowering all ſummer long. Linnæus confounded this, in the ſecond edition of *Sp. Pl.*, with his *barbarum,* from which it is very diſtinct. The *ſtem* and *branches* are firm and upright. *Leaves* obovate, oblique or twiſted, ſometimes minutely downy. Corolla paler, longer, and more ſlender. There is no prominent green line, running down the branches from each bud, as in the *barbarum.*—The preſent is *Rhamnus primus* of Cluſius and Dodonæus; ſee Ger. em. 1334. fig. 1.

9. L. *boerhaavifolium.* Glaucous-leaved Box-thorn. Linn. Suppl. 150. (L. heterophyllum; Murr. Comm. Gott. for 1783. p. 6. t. 2. Ehretia halimifolia; l'Herit. Stirp. faſc. 1. 45. t. 23.)—Leaves ovate, oblique, acute, glaucous. Spines lateral. Flowers in terminal cluſters.—Native of Peru. This is a very pretty *ſhrub,* with ſpines accompanying the buds on the ſtem and older branches; the young ſhoots are unarmed, ſlender, ſpreading horizontally. *Leaves* ſcattered, ſtalked, about an inch long, ovate, entire, glaucous, ſmooth. *Flowers* ſeveral together, in a cluſter, or ſhort panicle, at the end of each branch, purpliſh, very fragrant. *Calyx* hemiſpherical, with five ſharp equal teeth. *Corolla* rather ſhort and funnel-ſhaped, with long projecting ſtamens and ſtyle; the former hairy at the baſe. The *ſtigma,* according to l'Heritier, is ſometimes capitate, ſometimes cloven, or of two valves, which muſt ſurely be owing to the different periods of its age.

10. L. *barbatum.* Fringed Box-thorn. Murr. in Syſt. Veg. ed. 14. 228. Thunb. Prodr. 37. Tr. of Linn. Soc. v. 9. 155. (L. inerme; Linn. Suppl. 150.)—Leaves ovate, ſmooth. Branches zigzag, without ſpines. Panicles axillary.—Gathered by Thunberg at the Cape of Good Hope, on little hills about Cape-town and elſewhere, flowering in Auguſt and the following months. "The *ſtem* is ſhrubby, quite ſmooth, two feet high or more, with alternate, ſpreading, zigzag, rugged, grey *branches.* *Leaves* oppoſite, ſtalked, ovate, pointed or bluntiſh, entire, ſmooth, green above, pale beneath, an inch or more in length. *Footſtalks* three quarters of an inch long. *Flowers* axillary, panicled, on capillary ſtalks. *Stipulas* or *bracteas* fringed with white. *Berry* two-lobed, compreſſed, abrupt, with two furrows and two cells." *Thunb.*—Of this we have neither ſeen a ſpecimen nor figure, nor has it yet appeared in any Engliſh garden.

11. L. *carolinianum.* Carolina Box-thorn. Mich. Boreal-Amer. v. 1. 95. Donn Cant. ed. 5. 47.—Leaves ſpatulate-oblong. Branches without ſpines. Flowers four-cleft.—Native of the ruſhy ſalt-marſhes of Carolina, Georgia, and Florida. Said to have been brought to England in 1806. The *ſtem* is ſhrubby. *Leaves* narrow. *Flowers* blueiſh, four-cleft, with four ſtamens.

LYCIUM, in *Gardening,* contains plants of the ſhrubby exotic kind, of which the ſpecies cultivated are the African boxthorn (L. afrum); the willow-leaved boxthorn (L. barbarum); the European boxthorn (L. europæum); and the Tartarian boxthorn (L. tartaricum).

The ſecond ſort affords ſeveral varieties. The firſt has a ſhrubby ſtalk ſeven or eight feet high, ſending out ſeveral irregular branches, armed with ſtrong ſpines, and furniſhed with ſhort thick leaves: the flowers which come out from the ſide of the branches are ſmall and purple. They appear in July and Auguſt, but do not produce ſeeds in this climate.

The ſecond has the ſtalk four or five feet high, ſending out many irregular branches, covered with a very white bark, and armed with a few ſhort ſpines; the leaves are about three inches long, and one inch broad in the middle, alternate, pale green. The flowers appear in May, and are ſucceeded by ſmall round berries that ripen in the autumn, when they become as red as coral.

The third riſes with weak irregular diffuſed branches to a great height, requiring ſupport; ſome of theſe branches have in one year been upwards of twelve feet long; the lower leaves are more than four inches long, and three broad in the middle; they are of a light green and a thin conſiſtence, placed without order on every ſide of the branches. As the ſhoots advance in length, the leaves diminiſh in ſize, and towards the upper part are not more than an inch long and a quarter of an inch broad; ſitting cloſe to the ſtalks on every ſide. The flowers come out ſingly at every joint towards the upper part of the branches, on ſhort tender peduncles, and are of a pale colour with ſhort tubes; the brims are ſpread open, broader than either of the former ſorts, and the ſtyle is conſiderably longer than the tube of the corolla.

Method of Culture.—All theſe plants may be increaſed by ſeeds, cuttings, or layers.

The ſeeds ſhould be ſown in the autumn ſoon after they are ripe, in pots, being plunged into an old tan-bed in winter, and covered with the glaſſes in froſty weather; but in mild weather be open to receive moiſture; in the following ſpring the pots ſhould be plunged into a moderate hot-bed, to bring up the plants, which muſt be inured to bear the open air as ſoon as the danger of froſt is over, and when they are three inches high, be ſhaken out of the pots, and each planted in a ſmall ſeparate pot filled with loamy earth, being placed in the ſhade till they have taken new root, when they may be removed to a ſheltered ſituation, to remain till the autumn, when they ſhould be either removed into the greenhouſe, or placed under a hot-bed frame, to ſhelter them from hard froſt. They muſt at firſt be kept in pots, and treated in the ſame way as myrtles, and other hardy greenhouſe plants; but when they are grown ſtrong, a few of them may be planted out in the open ground in warm ſituations, where they ſtand moderate winters, but are commonly deſtroyed by hard froſts.

The cuttings ſhould be made from the young ſhoots, and be planted in a ſhady border in July, being duly watered; and when they have taken root, be treated in the ſame manner as the ſeedling plants. This is the uſual mode of increaſing them, as ſome ſorts never produce ſeeds in this climate.

In the third ſort the cuttings ſhould be planted in the ſpring, in an eaſtern border; and the plants ſhould not be removed till the autumn, when they may be planted to cover walls, as the branches are too weak to ſupport themſelves.

The third variety may alſo be increaſed by dividing and planting its creeping roots.

The layers muſt be made from the young branches, and be laid down in the ſpring; and when rooted in the autumn, taken off, and managed as in the other methods.

The hardy ſorts afford variety in warm ſituations in the open ground, and the other ſorts among greenhouſe collections.

Lycium, in the *Materia Medica*, the name of a fruit called by the French *baye d'Avignon*, the Avignon berry, and by many authors the *pyracantha*. The ſhrub which produces it is the lycium ſive pyracantha of Gerrard. (See Lycium, *ſupra*) The fruit is about the ſize of a grain of wheat, and is not round, but of an angular form when dried, ſometimes of three, ſometimes of four angles, and ſometimes dented in at one end like a heart. It is of a yellowiſh-green colour, and of a bitter and aſtringent taſte. It ſhould be choſen freſh dried, and large. There was formerly a rob, or inſpiſſated juice made from theſe berries, much in uſe in medicine; but this was generally adulterated with a rob made of the berries of the woodbine, privet, ſloe, or other ſhrub, and is now quite out of uſe. The dyers in France and Holland uſe it for a yellow; and the Dutch have another uſe for it, which is, that they boil it in alum-water, and mixing it in whiting, form it into twiſted ſticks, which they ſell to the painters in water-colours, under the name of *ſtil de grain*.

LYCOCTONON. See Aconite.

LYCODONTES. See Bufonitæ.

LYCOGALA, in *Botany*, ſo named by Micheli, from λυκος, *a wolf*, and γαλα, *milk*, a genus of the fungus tribe, whoſe internal appearance and ſubſtance, in an early ſtate, are like a maſs of thick cream. It is included under *Mucor* by Linnæus, Schreber, and others. Perſ. Syn. 157. Mich. Gen. 215. t. 95. Albert. and Schwein. 83. (Reticularia; Bulliard Fung. v. 1. t. 476. f. 1—3.)—Claſs and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Eſſ. Ch. Caſe roundiſh, membranous, ſmooth, lodging a maſs, originally pulpy and deliqueſcent, finally powdery intermixed with diſtant internal fibres.

1. L. *argenteum*. (L. griſeum majus; Mich. Gen. 216. t. 95. f. 1. Reticularia Lycoperdon, var. 2; Bull. Fung. v. 1. 95. t. 476. f. 1. Mucor lycogalus; Bolt. Fung. v. 3. 133. t. 133. f. 2)—Cuſhion-ſhaped, ſomewhat hemiſpherical, naked, even of a ſilvery white.—Found upon rotten wood in autumn.—About an inch or more in diameter, brown and pulpy when young, of a brilliant white when arrived at maturity, diſcharging, by one or more irregular accidental openings, a maſs of rich dark ſnuff-coloured powder.

2. L. *turbinatum*. (Reticularia Lycoperdon, var. 3; Bull. v. 1. 95. t. 476. f. 2.)—Top-ſhaped, naked, even, pale brown.—Found in ſimilar ſituations, though rarely. But half the ſize of the former, at moſt, and furniſhed with a kind of ſhort ſtalk, which gives it a pear-ſhaped figure. Hence Perſoon was induced to make this a diſtinct ſpecies, though he appears to have known it merely by the account of Bulliard. The latter ſays it is pellucid when young.

3. L. *punctatum*. (Reticularia Lycoperdon, var. 4; Bull. v. 1. 95. t. 476. f. 3.)—Aggregate, globoſe, dotted, greyiſh.—Found on rotten wood.—Nearly as big as the firſt, but more globoſe, and of an aſhy-grey; its ſurface dotted all over with minute points.

4. L. *atrum*. Albert. and Schwein. n. 233. t. 3. f. 3.—Cuſhion-ſhaped, black. Its powder is intermingled with branched, tree-like, radiating fixed threads. This, not mentioned by Perſoon, is deſcribed by the above authors of the *Conſpectus* of Fungi, growing near Niſke in Upper Luſatia, as found upon fir trees from April to June, and more ſparingly in October and November. It is the ſize and ſhape of the firſt ſpecies; white in the beginning, then of a dirty yellow, afterwards reddiſh-brown, and finally black. This fungus is remarkable for leaving, as it were, a ſkeleton of branched black fibres, radiating from a centre, when the coat and powder are gone.

5. L. *miniatum*. Perſ. n. 4. (L. miniata; Perſ. Obſ. Mycol. faſc. 2. 26. L. globoſum, grani piſi magnitudine, æris recocti colore; Mich. Gen. 216. t. 95. f. 2. Lycoperdon

don epidendrum; Linn. Sp. Pl. 1654. Hudſ. 645. With. v. 4. 385. Sowerb. Fung. t. 52. Bolt. Fung. v. 3. 119. t. 119. f. 1. Mucor; Schæff. Fung. t. 193.)—Aggregate, globoſe; at firſt ſcarlet; then brown, with roſe-coloured powder.—Common on the trunks of trees, after rain, in ſummer and autumn. Its vivid vermilion or ſcarlet hue, when young, is very ſtriking. In decay it turns brown or black. Mr. Sowerby has exhibited, in his t. 400. f. 2, 3, what he eſteems a luxuriant variety of this, but which ſeems to us a diſtinct ſpecies, being much larger, confluent, pale pink and veiny, ſoon turning quite black. In an early ſtate it looked like the inteſtines of a fowl.—*Lycoperdon piſiforme* of Linnæus is judged by Perſoon to be only a roughiſh-coated variety of this *Lycogala miniatum*.

6. L. *conicum*. Perſ. n. 5.—Scattered, conical; at firſt red; then purpliſh-violet.—Found, very rarely, on the rotten trunks of trees. About one or two lines high, exactly conical, but obtuſe, clothed with little ſcattered fibrous granulations. Powder of a violet red. *Perſoon.*

LYCOIDES, a term uſed by medical writers to expreſs the diſorders which ariſe in the human body by a long retention of the ſeed. Theſe are ſometimes madneſs, and very often dangerous quinſies and ſwellings, and inflammations about the neck and throat. If we conſider the natural tendency of the diſorders of this kind to affect the neck, and the remarkable ſwelling of the necks of bucks, and ſome other animals at rutting time, it may give ſome rational hints towards underſtanding the alteration of the voice in boys who arrive at puberty.

Blancard derives the word *lycoides*, from λυκος, *lupus*, and ειδος, *forma*, from a ſuppoſition that wolves are ſubject to this diſorder.

LYCOMING, in *Geography*, a county of America, in the N.W. part of Pennſylvania, bounded N. by the ſtate of New York, and W. by Alleghany county; 150 miles long and 86 broad, being the largeſt in the ſtate. The north and weſt parts are unſettled. It is divided into 10 townſhips, and contains 5414 inhabitants.—Alſo, a creek, which runs ſouth, and diſcharges itſelf into the W. branch of Suſquehanna, a few miles W. of Loyalſock creek.

LYCOPERDASTRUM, in *Botany*, Baſtard Puff-ball, Mich. Gen. 219. t. 99. See SCLERODERMA.

LYCOPERDOIDES, Mich. Gen. 219. t. 98, a genus conſiſting of three ſpecies of fungi, very unlike each other. The firſt has a ſtout thick many-rooted ſtem, four inches high, and is the *Scleroderma tinctorium* of Perſoon, Syn. 152. The others are ſubterraneous productions, akin to the *Lycoperdon cervinum* of Linnæus.

LYCOPERDON, ſo called by Tournefort, from λυκος, *a wolf*, and περδὼ, *to explode backwards*, this author having certainly improved the old fooliſh name, *Crepitus lupi*, by making it leſs generally intelligible. We do not preſume to account for this curious appellation. The French call the fungus to which it is applied *Veſſe-loup*, or Wolf-bladder; the Engliſh *Puff-ball*; and the Germans *Boſiſt*; from which laſt Dillenius contrived the barbarous name *Boviſta*. Linn. Gen. 569. Schreb. 770. Mart. Mill. Dict. v. 3. Perſ. Syn. 140. Juſſ. 5. Tourn. t. 331. Lamarck Illuſtr. t. 887.—Claſs and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Eſſ. Ch. Caſe cauleſcent, burſting irregularly at the top, clothed with ſcaly or pointed warts.—(The powder or ſeed is greeniſh.) *Perſoon.*

The author laſt mentioned defines 14 ſpecies of this genus, very properly reſtricting it to ſuch fungi as anſwer to the above character, and excluding the ſtarry puff-balls, (ſee GEASTRUM); as well as the *Tuber*, the *Scleroderma*, and ſome others which Linnæus comprehended under his *Lycoperdon*. Examples are

L. *giganteum*. Perſ. n. 1. Batſch Fung. t. 165. (L. maximum; Schæff. Fung. v. 4. 130. v. 2. t. 191. L. Boviſta; Bulliard t. 447. L. Proteus; Sowerb. Fung. t. 332, two upper figures.)—This is often found as big as a man's head, in dry upland paſtures, in various parts of England and the ſouth of Europe. When the upper part, and the whole powdery contents, are blown away, the ſpongy baſe, with a thin torn edge, remains for a conſiderable time. The root is ſmall, but tough.

L. *pyriforme*. Perſ. n. 12. Schæff. Fung. v. 4. 128. v. 2. t. 185. (L. ovoideum; Bulliard t. 435. f. 3.)—Found on rotten ſtumps in beech woods in autumn. It is an inch and a half high, and an inch broad, tapering at the baſe, and pointed at the top, of a dirty browniſh-white.

L. *goſſypinum*. Perſ. n. 14. Bulliard t. 435. f. 1.—Found on rotten wood in France. A pretty ſpecies, about one-fourth of an inch in diameter, globoſe with a ſhort taper baſe, all over white or pale grey, and covered as it were with a fine down or cottony ſubſtance.

LYCOPERSICON, from λυκος, *a wolf*, and μηλον περσικον, *a peach*, the Tomato, or Love-apple, *Solanum Lycoperſicum* of Linnæus. This fruit is valued for its grateful acidity in Italy, Spain and Portugal, where it makes a principal ingredient in many ſoups and other diſhes, being moreover ſuppoſed to poſſeſs a ſtimulating, or aphrodiſiac property. Raiſed in England, its flavour is more inſipid, and its qualities not in any reſpect, as far as we have heard, remarkable; except that few ſtomachs can bear it in any great quantity. The fruit is beſt fried in ſlices, peppered and ſalted, as a ſauce for game or any roaſt meat.

LYCOPHRON, in *Biography*, ſon of Periander, king of Corinth, flouriſhed about five hundred and fifty years before the Chriſtian era. The murder of his mother Meliſſa, by his father, had ſuch an effect upon him, that he reſolved never more to ſpeak to him. This reſolution was ſtrengthened by their uncle Proclus, king of Epidaurus, who took Lycophron and his brother under his protection. When the infirmities of Periander obliged him to look for a ſucceſſor, Lycophron, who was then in the iſland of Corcyra, refuſed to come to Corinth while his father was there, and he was induced to promiſe to ſettle in that city, only on condition that his father would come and dwell on the iſland which he left. So fearful, however, were the Corcyrians of the tyranny of Periander, that they killed the ſon to prevent the meditated exchange from taking place.

LYCOPHRON, a famous Greek poet and grammarian, was born at Chalcis, in Eubœa, and flouriſhed about three hundred years before the Chriſtian era. He was one of thoſe poets who lived in the reign of Ptolemy Philadelphus, and who from their number obtained the name of Pleiades. According to Ovid he was ſlain by an arrow. He was author of ſeveral tragedies, of which the titles of twenty have been preſerved; but the only work that has come down to us, is a very ſingular poem, entitled "Alexandra," or Caſſandra, the ſubject of which is a ſeries of predictions feigned by him to have been uttered by that daughter of Priam. This poem contains 1474 verſes, the obſcurity of which has procured the epithet of "Tenebroſus" to its author. It is a mixture of prophetical effuſions, ſuppoſed to have been delivered by Caſſandra during the Trojan war. The beſt editions are that of Baſil, 1546, enriched with a commentary by Tzetzes; that of Canter, 1596; and that of our countryman, archbiſhop Potter, in 1702.

LYCOPHTHALMUS, the *wolf's eye-ſtone*, a name given by ſome authors to ſuch pieces of agate, or any other ſemi-pellucid ſtone, as happen to have circular ſpots in them, reſembling in colour the eye of that animal.

LYCOPODIOIDES, in *Botany.* See the following article.

LYCOPODIUM, from λυκος, *a wolf,* and πȣς, *the foot,* from the incurved, and often finger-like, ſhape of the ſpikes or extreme branches. Club-moſs, or Wolf's-claw.—Linn. Gen. 561. Schreb. 753. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 1108. Swartz. Fil. 174. Brown Prodr. Nov. Holl. v. 1. 165. Juſſ. 12. Lamarck Illuſtr. t. 872. Michaux Boreal-Amer. v. 2. 282. Dill. Muſc. 441. (Lycopodioides; Dill. Muſc. 462. Selago; ibid. 435. Selaginoides; ibid. 460.)—Claſs and order, *Cryptogamia Muſci,* Linn. *Crypt. Miſcellaneæ,* Schreb. *Crypt. Filices,* Smith. *Crypt. Lycopodineæ,* Swartz.—Nat. Ord. *Muſci,* Linn. Dill. *Muſci ſpurii,* Juſſ. *Lycopodineæ,* Brown.

Eſſ. Ch. Capſules axillary, ſeſſile, naked, moſtly ſolitary, of one cell; ſome kidney-ſhaped, of two elaſtic valves, and full of fine powder; others two or three-lobed, of two or three valves, lodging from one to ſix globoſe bodies.

This beautiful and ample genus, one of the moſt elegant, with reſpect to habit, in the whole vegetable kingdom, holds as it were an intermediate place between the ferns and moſſes. Some botaniſts have therefore been moſt inclined to refer it to the one tribe, others to the other. Its habit, moſt like the moſſes, does yet by no means ſtrictly accord with that order; and their fructification, being now well underſtood, ſeparates them diſtinctly from *Lycopodium,* whoſe nature in that reſpect is almoſt totally in the dark, agreeing ſo far with ferns. The ſeeds of the latter, however produced, agree as nearly as can be with the powder found in the compreſſed or kidney-ſhaped capſules of the genus in queſtion, which powder moreover has been likewiſe proved, by experiment, to be real ſeed. But the globular bodies found in peculiar capſules upon *L. denticulatum* and other ſpecies, proved themſelves ſeeds by germinating, according to Brotero, Tr. of L. Soc. v. 5. 162, yet ſuch ſpecies are furniſhed beſides with what ſeems to be the genuine fruit of the genus. In this difficulty Profeſſor Swartz and Mr. Brown have prudently contented themſelves, in the generic character, with mentioning theſe two kinds of apparent capſules and ſeeds, without poſitively aſſerting either to be ſuch.

Joſeph Fox, a poor journeyman weaver of Norwich, is the firſt perſon upon record who ever raiſed plants of *Lycopodium Selago* from the duſt of the kidney-ſhaped capſules; ſee Tr. of Linn. Soc. v. 2. 314, where Mr. Lindſay's account of having ſucceeded equally well with the duſt of *L. cernuum* in Jamaica, is alſo to be found. Sprengel cites the authority of Profeſſor Willdenow in confirmation of this. We cannot but admit therefore that this duſt, ſo exactly reſembling the known ſeed of ferns, is real ſeed. This is the *Pulvis Lycopodii,* formerly kept in the apothecaries ſhops, on account of ſome reputed qualities long ſince diſbelieved. It is ſtill uſed in Germany to produce the appearance of lightning upon the ſtage; for being very light and highly inflammable, it takes fire inſtantaneouſly, with a ſort of hiſſing exploſion, while floating in the air. The duſt of *L. clavatum* is collected and ſold on the continent, for this purpoſe. With reſpect to the globular bodies, whoſe bulk is beyond all meaſure greater than that of theſe minute ſeeds, it is impoſſible to doubt the aſſertion of Profeſſor Brotero, who in the fifth volume of the Tranſactions of the L. Soc. deſcribes their germination, radicle, cotyledons, &c.; ſo that we muſt allow the exiſtence of two kinds of ſeed on the ſame plant. The ſame phenomenon has been ſuſpected in the genera *Fucus* and *Conferva,* though botaniſts have been ſo juſtly cautious of admitting it, that they have not dared to truſt their own eyes. Perhaps the actual exiſtence of the fact in *Lycopodium,* may ſanction our belief of it in theſe other inſtances. The difference however between theſe two kinds of ſeeds in *Lycopodium* is far more eſſential than Profeſſor Sprengel ſeems to inſinuate, when he ſays it "only proves that the capſules of ſeveral ſpecies of this genus are of two different ſhapes." (Crypt. 195, Engliſh tranſlation.) Nothing can be greater than the apparent difference betwixt the two kinds of ſeeds themſelves, which is ſuch as to overſet all analogy hitherto known. An idea advanced in Engl. Bot. v. 16. p. 1148, that the kidney-ſhaped capſules may be abortive ones, can hardly be admitted; for although we hear of no experiment made with the contents of the two different kinds of capſules from the ſame individual plant, (which if plants could be raiſed from both, would be truly an *experimentum crucis*;) yet the kidney-ſhaped capſules of the ſpecies in queſtion, *L. Selaginoides,* are too preciſely like thoſe from which vegetating ſeeds have been obtained, to allow of a doubt concerning them. We ought not to omit that Dillenius firſt obſerved theſe different kinds of ſeeds in *Lycopodium,* and has founded upon them the different genera into which he has divided it, as quoted among the ſynonyms above.

The 14th edition of *Syſt. Veg.* contains 29 ſpecies of *Lycopodium,* ſix of which are Britiſh. Profeſſor Swartz defines 65; excluſive of the Linnæan *nudum,* which he eſtabliſhes as a diſtinct genus, by the name of *Pſilotum;* as well as of ſeveral others, which he finds mentioned in books, but could not ſatisfactorily aſcertain.—Fifteen ſpecies have axillary ſeſſile capſules, all uniform, of two valves, containing the above-deſcribed powdery kind of ſeeds. The remaining 50 bear their capſules in terminal ſpikes, each capſule being accompanied by a peculiar ſcale or bractea, generally toothed or fringed, totally unlike the leaves, and moſtly of a paler or more tawny colour. Of theſe 50, 26 have the ſame kind of capſules and ſeeds as the above 15, and no other; one, (*L. Selaginoides,* Engl. Bot. t. 1148.) has, beſides ſuch capſules, very remarkable four-lobed ones, of two three-lobed valves, and containing four globoſe white ſeeds. The remainder have kidney-ſhaped as well as roundiſh, rarely three-lobed, capſules, either intermixed in the ſame ſpike, or the former are in the upper part, the latter in the lower. By this ſtatement it appears, that no known ſpecies is without the kidney-ſhaped compreſſed capſule, bearing the minute duſt-like ſeed, analogous to that of ferns; the larger globoſe ſeed being, as it ſeems, more of an adventitious nature.

Examples of the axillary ſpecies are,

L. *linifolium.* Linn. Sp. Pl. 1563. Sw. n. 1. (Selago linariæ foliis; Dill. Muſc. 440. t. 57. f. 5.)—Leaves alternate, remote, lanceolate.—Native of South America and the Weſt Indies. Taken up by Dillenius from Plumier, who in his *Filices,* t. 166. f. C, C, gives an original plate of this ſpecies, which no other botaniſt appears to have ſeen. The *root* is fibrous. *Stems* ſeemingly pendulous, above two feet long, ſlender, ſlightly branched, leafy throughout. *Leaves* ſcattered, half an inch at leaſt diſtant from each other, often near two inches long, entire, taper-pointed, ſomewhat ovate and twiſted at the baſe. *Capſules* axillary, ſolitary, kidney-ſhaped. No other known ſpecies can vie with this in the ſize and diſtance of its leaves.

L. *gnidioides.* Linn. Suppl. 448. Sw. n. 4.—Leaves three in a whorl, imbricated, ovato-lanceolate, obtuſe, entire. Branches elongated.—Gathered in the iſland of Mauritius by Sonnerat or Commerſon, and given by Thouin to the younger Linnæus. No other botaniſt ſeems to have ſeen the plant. It appears to be very tall, with the habit of the former, but differs eſſentially in its much cloſed and whorled *leaves*, not half an inch long, blunt and concave, without rib or vein; the upper ones very gradually ſhorter and more ovate, with ſolitary, paliſh, axillary, roundiſh, ſlightly reniforme, *capſules*.

L. *Selago*. Fir Club-moſs. Linn. Sp. Pl. 1565. Engl. Bot. t. 233. Sw. n. 12. Fl. Dan. t. 104.—Leaves ſcattered, in eight rows, ſomewhat imbricated, lanceolate, acute, rather concave. Stem forked, erect, level-topped.—Native of rather moiſt mountainous heaths; the only Britiſh ſpecies of this firſt ſection. The *ſtems* are about a ſpan high, beſet with dark, ſhining, fir-like *leaves*. *Capſules* ſmall, browniſh-yellow.

The ſpiked ſpecies are not only numerous, but, in many inſtances, remarkable for ſize and beauty. The Britiſh ones are *inundatum*, Linn. Sp. Pl. 1565. Engl. Bot. t. 239; *alpinum*, ib. 1567. E. Bot. t. 234;—*annotinum*, ib. 1566. E. Bot. t. 1727;—and the common *clavatum*, ib. 1564, E. Bot. t. 224.—This laſt grows abundantly on dry mountainous heaths, creeping on the ground to the extent of ſeveral feet; the fruit-bearing branches only being erect. Theſe bear one, two or three, finger-like denſe ſpikes of ovate, taper-pointed, membranous-edged, imbricated *bracteas*, each with an axillary ſolitary brown *capſule*.

Of the foreign ones none is more ſtriking than L. *Phlegmaria*. Linn. Sp. Pl. 1564. (L. erectum dichotomum, foliis cruciatis, ſpicis gracilibus; Dill. Muſc. 450. t. 61. f. 5.)—Leaves ovate or heart-ſhaped, entire; the lower ones four in a whorl. Spikes thread-ſhaped, forked.—This grows in various parts of the Eaſt Indies, as well as in the iſle of Bourbon. Mr. Menzies gathered our ſpecimen in Otaheite. It is 18 inches or more in height, ſlightly forked or branched, clothed with numerous ſhining *leaves*, not ſo regularly whorled, at leaſt the upper ones, as Dillenius found them. The long, terminal, ſlender, forked *ſpikes*, with their little roundiſh *bracteas*, ſcarcely broader than the accompanying *capſules*, are very ſingular.

Among the ſpecies with two ſorts of capſules is

L. *flabellatum*. Linn. Sp. Pl. 1568. (Lycopodioides dentatum erectum filicinum, caule tereti ramoſiſſimo; Dill. Muſc. 468. t. 65. f. 5. Muſcus ſquamoſus erectus; Plum. Fil. t. 43. Amer. t. 24.)—Leaves two-ranked, ovate, oblique, fringed at the baſe, accompanied by a double row of ſmaller imbricated ones in front. Stem round, repeatedly branched, flattened above.—The figures of this ſpecies, which is found in the Weſt Indies, give but an inadequate idea of its beauty. Its flat fan-like ſhape, and the exquiſitely neat arrangement of the innumerable little ſhining *leaves*, give it a peculiar and ſtriking aſpect. The *ſpikes* are ſmall, and ſparingly produced. *Root* fibrous. Whole *plant* from one to two feet high.

LYCOPOLIS, in *Ancient Geography*, viz. *the city of the Wolves*, an ancient town of Upper Egypt, in the Thebais, ſituated on the weſtern ſide of the Nile; ſo called, becauſe extraordinary worſhip was paid here to wolves, which, according to Diodorus Siculus, drove back the Ethiopians when they invaded Egypt, and purſued them to Elephantina, on the borders of Ethiopia. This city is ſuppoſed to have ſtood where the preſent town of Monfalut now ſtands.

LYCOPSIS, in *Botany*, ſo called by Pliny, being alſo the λυκοψις of Dioſcorides, owes its derivation to λυκος, *a wolf*, and οψις, *a face*, or *countenance*, from the circumſtance of the flowers being ringent, and having the appearance of a grinning mouth; the herbage is alſo furniſhed, ſays Ambroſinus, with a ſort of rigid hairineſs ſimilar to the coat of a wolf. Linn. Gen. 78. Schreb. 103. Willd. Sp. Pl. v. 1. 779. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 220. Ait. Hort. Kew. ed. 2. v. 1. 297. Juſſ. 131. Lamarck Illuſtr. t. 92. Gærtn. t. 67.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Aſperifoliæ*, Linn. *Borragineæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, in five, oblong, acute, ſpreading, permanent ſegments. *Cor.* of one petal, funnel-ſhaped; tube cylindrical, bent in a curve; limb five-cleft half way down, obtuſe; mouth cloſed, with five convex, prominent, uniting ſcales. *Stam.* Filaments five, very ſmall, placed at the curve of the tube of the corolla; anthers ſmall, covered. *Piſt.* Germens four, ſuperior; ſtyle thread-ſhaped, the length of the ſtamens; ſtigma obtuſe, cloven. *Peric.* none, except the very large, inflated calyx. *Seeds* four, rather long.

Eſſ. Ch. Corolla with a curved tube, its mouth cloſed with convex ſcales.

Linnæus was acquainted with ſeven ſpecies of *Lycopſis*, to which Willdenow has added two more, L. *ciliata*, and *obtuſifolia*. This genus is particularly marked by the tube of the flowers being curved; indeed this circumſtance is conſidered by Linnæus and Willdenow as a ſufficient eſſential character. The following ſpecies will ſerve to illuſtrate the genus.

L. *pulla*. Dark-flowered Bugloſs. Linn. Sp. Pl. 198. Jacq. Auſtr. t. 188.—Leaves entire. Stem erect. Calyx, when in fruit, inflated, pendulous.—Found in fields and by road-ſides in Tartary and Germany, where it flowers from the beginning of May to July.—*Root* perennial, of nearly a finger's thickneſs, long, blackiſh. *Stem* about a foot high, roundiſh; ſimple below; dividing upwards into flowering branches. *Leaves* alternate, ſeſſile, ſoft, thickiſh, pale green. *Flowers* ſolitary; petals ſmooth, dark purple or nearly black, the tube reddiſh at its baſe, the limb marked with five ſunk dots at the bottom. *Seeds* roundiſh, ſomewhat rugoſe, ſticking to the pendulous and ſwelling calyx.

L. *arvenſis*. Small Bugloſs. Linn. Sp. Pl. 199. Engl. Bot. t. 938. Curt. Lond. faſc. 5. t. 17. Fl. Dan. t. 435.—Leaves lanceolate, briſtly. Calyx, when in flower, erect.—Very common in fields and waſte places all over England. It flowers in June and July.—The whole plant is hiſpid. *Stem* round, angulated, erect, branched. *Leaves* oblong heart-ſhaped, embracing the ſtem. *Cluſters* in pairs, terminal, leafy. *Flowers* ſmall, of a lively blue colour, with a white eye. *Seeds* angular, rugoſe, tuberculated. The juices of this plant are mucilaginous, like thoſe of Borage.

LYCOPUS is ſaid to be derived from λυκος, *a wolf*, and πους, *a foot*, though we are perfectly incompetent to trace the origin of ſuch a derivation. Linn. Gen. 15. Schreb. 20. Willd. Sp. Pl. v. 1. 120. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 29. Ait. Hort. Kew. ed 2. v. 1. 47. Brown. Prod. Fl. Nov. Holl. 500. Tournef. t. 89. Juſſ. 111. Lamarck Illuſtr. t. 18.—Claſs and order, *Diandria Monogynia*. Nat. Ord. *Verticillatæ*, Linn. *Labiatæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, cloven half way down into five, narrow, acute, ſegments. *Cor.* of one petal, rather unequal; tube cylindrical, the length of the calyx; limb obtuſe, ſpreading in four, nearly equal diviſions; the upper one broader, emarginate; the lower ſmaller. *Stam.* Filaments two, generally longer than the corolla, inclining to the upper ſegment; anthers ſmall. *Piſt.* Germen ſuperior, four-cleft; ſtyle thread-ſhaped, ſtraight, as long as the ſtamens; ſtigma cloven, reflexed. *Peric.* none, except the calyx containing the ſeeds in its bottom. *Seeds* four, roundiſh, bluntiſh.

Eſſ. Ch. Corolla four-cleft; one of its lobes notched. Stamens diſtant. Seeds four, naked, blunt.

1. L. *europæus.* Water Horehound. Gypſywort. Linn. Sp. Pl. 30. Engl. Bot. t. 1105. Curt. Lond. faſc. 3. t. 2. —Leaves very deeply ſerrated.—Found abundantly on the banks of pools and ditches, in a ſandy ſoil, flowering in July and Auguſt.—*Root* perennial. *Stem* ſquare. *Leaves* oppoſite. *Flowers* white, many in a whorl. *Seeds* four, obovate, blunt, ſquare, furrowed.—The whole herbage is inodorous, though the flowers are ſometimes ſweet-ſcented. It varies occaſionally in having deeply pinnatifid leaves, more or leſs hairy; indeed they are ſcarcely ever quite ſmooth. Dr. Smith remarks that "the glandular dots, form of the corolla, and whole habit ſhew the affinity of this plant to *Mentha*;" but he thinks that the ſeeds would ſerve ſufficiently to diſtinguiſh it without adverting to the number of its ſtamens.

2. L. *exaltatus.* Italian Water Horehound. Linn. Suppl. 87. Willd. n. 2. Sm. Fl. Græc. Sibth. v. 1. 9. t. 12.—Leaves pinnatifid, toothed. Calyx four or five-cleft.—A native of Italy, and alſo of Greece in Lupadia and Bithynia, flowering in the ſummer.—*Root* perennial, creeping. *Stem* erect, from four to ſix feet high, leafy, hairy, often tinged with red. *Leaves* oppoſite, croſſing each other in pairs, deeply pinnatifid, hairy on both ſides. *Whorls* axillary, ſeſſile, denſe, many-flowered. *Bracteas* ſmall, linear-lanceolate, acute. *Corolla* tubular, white, a little longer than the calyx, mouth hairy. *Seeds* obovate, blunt, covered with reſinous dots, aromatic.

The pinnatifid variety of L. *europæus* has by ſome authors been confounded with the preſent plant; but on account of that ſpecies having a more humble ſtem, the ſegments of its leaves never toothed, and the calyx invariably five-cleft, Dr. Smith thinks they are ſufficiently diſtinct.

3. L. *virginicus.* Linn. Sp. Pl. 30. Michaux. Boreal-Amer. v. 1. 14.—Leaves ſtalked, elliptical, tapering at each end, equally ſerrated.—A native of America, from New England to Carolina. It flowers in the autumn.—The Linnæan ſpecimen of this ſpecies has *leaves* above an inch in breadth, with ſtrong, though not deep ſerratures. It therefore very ill agrees with the definition in *Flora Virginica*, "Leaves lanceolate, very finely ſerrated," or with Clayton's account, "Leaves long, narrow, and graſſy." It anſwers, however, exactly to Michaux's definition, "Leaves broadly lanceolate, ſerrated, contracted, and entire at the baſe."—The flowers are numerous, in denſe whorls. *Seeds* angular, each crowned with ſeveral blunt teeth.

Beſides the three ſpecies above deſcribed, Mr. Brown, in his Prodromus to the Flora of New Holland, mentions another, which he calls *auſtralis*, with the following character, "Leaves lanceolate, pointed, ſerrated, downy, roughiſh above, glandular beneath, entire, and attenuated at the baſe: ſerratures remote, equal, very acute. Stems ſtriated." This is found all over New Holland, and in Mr. Brown's opinion is very nearly allied to L. *europæus.* Michaux has another ſpecies under the name of *uniflorus*, which is thus characterized. "*Plant* very ſmall. *Root* tuberous. *Stems* ſimple. *Leaves* oval, obtuſe, obſoletely toothed. *Flowers* axillary, ſolitary." This is a native of North America.

LYCOSTAPHYLÆ, *wolf's grapes*, a name given by ſome of the Greek writers to the *pomum amoris*, a kind of eſculent nightſhade, which we have much more properly called *lycoperſicon*, the *wolf's peach.* (See SOLANUM.) Æmilius Macer tells, that the nightſhades, in general, were called by the name *morella* in his time: his words are, "herbam quam Græci ſtrychnum dixere, Latini morellam dicunt." The name *morella* ſeems to be formed upon the word *morion*, a name given both by the Greeks and Latins to one of the ſleepy nightſhades, and to the male mandrake of Dioſcorides, which the ſhepherds were fond of eating; but which brought on ſleepy diſorders, if taken too largely.

LYCOSTOMUS, in *Ichthyology*, the name given by Ælian, and many other of the Greek authors, to the *anchovy*, called by others the *encraulus* and *encrauſicholus*, and by the late writers *encraſicolus.* See CLUPEA *Encraſicolus*, and ANCHOVY.

LYCTOS, in *Ancient Geography*, a town ſituated in the interior of the iſle of Crete, and not far from Gnoſſus to the ſouth-eaſt. Of this town Polybius ſays, that it was a colony, originally of Lacedæmonians, and the moſt ancient of the Cretan towns, which produced men who were, without contradiction, the braveſt and moſt virtuous in the whole iſland. The priority of its exiſtence to Gnoſſus and Cortyna, however, has been doubted.

LYCURGIA, λυκουργεια, in *Antiquity*, a feſtival celebrated by the Spartans in memory of Lycurgus, whom they honoured with a temple, and an anniverſary ſacrifice.

LYCURGUS, in *Biography*, the celebrated legiſlator of Sparta, ſuppoſed to have been born about the year 926, was ſon of Eunomus, king of that country, and brother to Polydectes. He might have ſucceeded to the throne himſelf on the death of Polydectes, but knowing that the deceaſed king's widow was pregnant, he publicly declared that he would only hold the crown in truſt for the child, provided it ſhould prove a ſon. The queen, ambitious of retaining her place and dignity, propoſed to marry Lycurgus, and deſtroy the infant before its birth. Lycurgus took meaſures to prevent the completion of her wicked propoſals: ſhe was, in due time, delivered of a boy, which being brought to him, as he was ſitting at the table with the magiſtrates, he took it in his arms, placed it in the chair of ſtate, and exclaimed, "Here Spartans is your king." Lycurgus faithfully diſcharged the duty of regent and guardian during the minority of his nephew Charilaus, and as ſoon as the young prince came to years of maturity, he readily reſigned all authority into his hands, left Sparta, and travelled into ſeveral foreign countries, with the view of obſerving their laws and cuſtoms. He firſt viſited Crete, at that time governed by the laws of Minos: theſe laws he ſtudied moſt carefully, and contracted a friendſhip with Thales, whom he perſuaded to ſettle at Sparta. He thence paſſed over to Aſia, making obſervations on the principal Ionian cities, which were overwhelmed in luxury and effeminacy. Here he met with the works of Homer, which he tranſcribed and brought into Greece. The confuſion which followed his departure from Sparta, made his preſence again neceſſary, and he returned home at the earneſt ſolicitations of his countrymen. Perceiving that the diſorders of the ſtate admitted no other effectual remedy than a total change of the laws and conſtitution, he prepared to give a new legiſlative ſyſtem to Sparta. He took care to fortify his authority with the ſanctions of religion, and obtained from the oracle of Delphi a declaration, that the conſtitution he was about to eſtabliſh, would be the moſt excellent in the world. [For an account of his inſtitutions ſee the article LACÆDEMONIANS.] His principal object, as a patriot, was to render his country great and reſpectable among ſurrounding nations; this he attained, and Sparta, under the laws of Lycurgus, became a nation of invincible warriors, who, for a ſeries of years, bore the greateſt ſway in the affairs of Greece, and were the bulwark of their friends, and the dread of their foes. Lycurgus has been compared to Solon, the legiſlator of Athens, and it has been ſaid that the former gave his citizens morals conformable to the laws which he had eſtabliſhed, and that the latter had given the Athenians laws which coincided with their cuſtoms and manners. The office of Lycurgus demanded reſolution, and he ſhewed himſelf inexorable and ſevere. The Lacedæmonians ſhewed their reſpect for this great legiſlator by annually celebrating a feſtival in his honour, at which his praiſes were recited, and which was obſerved during ſeveral ages. It is not agreed in what manner, or when he died; according to Plutarch he voluntarily put an end to his life by abſtinence, while he was yet of an age to enjoy it. Lucian ſays he died at the age of eighty-five. The laws of Lycurgus were abrogated by Philopœmen in the year B.C. 188, but the Romans very ſoon re-eſtabliſhed them. Plutarch. Univer. Hiſt.

Lycurgus, an Athenian orator, ſon of Lycophron, flouriſhed in the time of Philip of Macedon, and is ſuppoſed to have died about the year 328 before Chriſt. He ſtudied philoſophy under Plato, and oratory under Iſocrates, and attaching himſelf to a political life roſe to eminence in the ſtate. The ſuperintendance of the public revenue was entruſted to him, in which office he conducted himſelf with the ſtricteſt integrity. He was appointed one of the magiſtrates, and in exerciſing the duties of his ſituation, he baniſhed all perſons of a diſſolute character, and made a number of very uſeful regulations. As he thought the higher kinds of poetry poſſeſſed ſuperior advantages, he patronized dramatic exhibitions, and cauſed ſtatues to be erected in honour of the principal tragedians. He was the friend of Demoſthenes, and a zealous advocate for liberty: when Xenocrates was dragged to priſon becauſe he had not paid the tribute exacted from ſtrangers, he liberated him and confined the farmer of the tax in his ſtead. Lycurgus was one of the thirty orators whom the Athenians refuſed to deliver up to Alexander. Some of his orations are preſerved, and have been printed in Collections of the Greek Orators. Plutarch. Lempriere.

LYCUS, in *Ancient Geography*, a river of Sarmatia, S.W. of Rhodus, which diſcharged itſelf into the Euxine ſea. It is mentioned by Ovid.—Alſo, a river, which, according to Herodotus, took its riſe in the country inhabited by the Thyſſagetæ, and traverſing that of the Mæotæ, ran into the Palus Mæotis. Ptolemy mentions this river, which is ſuppoſed to be the ſame with the preceding.—Alſo, a river of Aſia, in Phrygia.—Alſo, a river of Aſia Minor, in Caria, the ſource of which was in mount Cadmus, and it formed a lake in Latmicus Sinus.—Alſo, a river in Sicily, the ſame with Halycus.—Alſo, a river of Macedonia, mentioned by Plutarch.—Alſo, a river of Aſia Minor, in Myſia, in the canton of Pergamus.—Alſo, a river of Aſia, which proceeding from Armenia, watered the plain near the town of Heraclea, and diſcharged itſelf into the Iris.—Alſo, a river of Aſia, in Bithynia, the ſame with Rhyndacus, according to Pliny.—Alſo, a river of Aſia, in Pontus, which mixed its waters with thoſe of the Iris.—Alſo, a river of Aſia, in Cappadocia, according to Ptolemy, who ſays that it was one of the branches of the Abſorrus which fell into the Euxine ſea.—Alſo, a river of Aſia, in Aſſyria, according to Polybius and Ptolemy.—Alſo, a river of Aſia, in Syria, near the gulf of Iſſus, according to Pliny.—Alſo, a ſmall river of the iſle of Cyprus, which had its ſource in the interior of the iſland at mount Olympus, and diſcharged itſelf into the ſea to the weſt of Amathus.—Alſo, a river of Phœnicia, which ran between Byblos and Beryta, according to the Itinerary of Antonine.

LYDD, in *Geography*, a ſmall market-town in the hundred of Langport, in the lathe of Shepway, and county of Kent, England, occupies a low ſcite near the ſouth-weſtern extremity of the county, where a point of land running out into the ſea forms Dengeneſs bay, which, though very open, is of great ſervice for veſſels when the wind ſets violently from particular quarters. Leland ſays, “Lydde is counted as a part of Rumeney, is iii myles beyond Rumeney town, and is a market. The town is of a prety quantite, and the towneſch men uſe botes to the ſe, the which at this tyme is a myle of. The hole town is conteyned in one paroche, but that is very large. Ther is a place beyond Lydde, wher at a great numbre of holme trees groueth upon a banke of baches throwen up by the ſe: and ther they bat fowle, and kill many birdes.” The church, which is a ſpacious edifice, conſiſt of a nave, chancel, and aiſles, with a maſſive tower, ornamented with pinnacles at the weſt end. The monuments are numerous, and among them are many braſſes, chiefly for bailiffs and jurats of the town. Lydd is a corporate town by preſcription, and, like Romney, of which it is a member, is governed by a bailiff, jurats, chamberlain, and commonalty. The return under the population act of the year 1800 ſtated the number of houſes to be 204, that of the inhabitants 1303. The latter are chiefly engaged in fiſhing, and other maritime employments, of which ſmuggling is conſidered as forming a material branch. Lydd is 71 miles diſtant from London; has a ſmall market on Thurſdays, and an annual fair. The holm trees, or ſea hollies, mentioned by Leland, ſtill grow on the beach near the town.

On the point of land called Dengeneſs, is a light-houſe, 110 feet high, erected a few years ago, in place of a more ancient one, under the direction of Mr. James Wyatt, and partly on the model of the Eddyſtone light-houſe. This point is alſo defended by a fort, and ſeveral ranges of barracks have been erected in the vicinity. Beauties of England and Wales, vol. viii.

LYDDA, in *Ancient Geography*, a town of Judæa, in the tribe of Ephraim; which was one of the three towns that Demetrius, king of Syria, compelled the Samaritans to ſurrender to the Jews; it was alſo called Dioſpolis.

LYDGATE, John, in *Biography*, an early Engliſh verſifier, and a monk of the Benedictine abbey at St. Edmund's Bury, in the reign of Henry VI. He was educated partly at Oxford, and then travelled into foreign countries to acquire the learning of the times. He was the diſciple and friend of Chaucer, and was regarded as a prodigy of learning at the period in which he flouriſhed, and is ſaid to have been a good poet and rhetorician, geometrician, aſtronomer, and theologian. He opened a ſchool in his monaſtery for teaching the ſons of the nobility the arts of verſification and compoſition. He was an imitator of his maſter Chaucer, but is reckoned among thoſe who contributed to the improvement of the Engliſh language. His principal pieces are “The Fall of Princes,” from the French of Boccaccio; “The Story of Thebes,” chiefly from Guido Colonna; and “The Troy Boke,” or “Deſtruction of Troy.” Beſides theſe, a liſt has been given of his other pieces, amounting to 251, exiſting in MS. in different libraries.

LYDIA, in *Ancient Geography*, firſt called Mæonia, from Meon, king of Phrygia and Lydia, and afterwards Lydia, from Lydus, the ſon of Atys, one of its kings. Bochart, who denies the exiſtence of ſuch perſons as Meon and Lydus, derives the name Lydia from the Phœnician word *luz*, to wind, becauſe it lay on the banks of the Mæander, a river famous for its windings, and Mæonia, from a Greek tranſlation of the Phœnician word *lud*. Lydia and Mæonia are ſometimes diſtinguiſhed; that part where mount Tmolus ſtood, watered by the Pactolus, being properly called Mæonia, and the other lying on the coaſt of Lydia. Lydia, according to Pliny, Ptolemy, and other ancient geographers, was bounded by the Myſia major on the north, by Caria on the ſouth, by Phrygia major on the eaſt, and Ionia on the weſt. But the kingdom of Lydia, as the ancients underſtood it, extended from the river Halys to the Ægean ſea. The chief cities of Lydia were Sardis, the ſeat of king Crœſus, Philadelphia, formerly the ſecond city of Lydia, Thyatira, a colony of the Macedonians, and Magneſia, ſeated on the Mæander. The only mountain of any note in Lydia is Sipylus. Mount Tmolus was once very famous for its wine and ſaffron. The rivers of this country, moſt worthy of notice, are the Pactolus and the Cayſter.

As to the origin of the Lydians, Joſephus, and almoſt all eccleſiaſtical writers after him, derive them from Lud, the fourth ſon of Shem, an opinion founded merely on the ſimilarity of names. Some of the ancients ſuppoſe them to be a mixed colony of Phrygians, Myſians, and Carians. Others, finding ſome conformity in religion between the Egyptians and Tuſcans, who were a Lydian colony, conclude that they were originally Egyptians. Their fables, however, ſhew that they were a very ancient nation, and of their high antiquity there is ample evidence.

The Lydians began, at a very early period, to be governed by kings, whoſe ſovereignty ſeems to have been deſpotic, and the crown hereditary.

Of their kings there are three diſtinct races on record, *viz.* the Atyadæ, ſo called from Atys, the ſon of Cotys and grandſon of Manes; the Heraclidæ, or deſcendants of Hercules, who began to reign about the time of the Trojan war; and the Mermnadæ, who began to reign not long before the Medes ſhook off the Aſſyrian yoke, of which race the firſt king was Gyges, and the laſt Crœſus. As to the character of the Lydians, they were under Crœſus, and ſome of his predeceſſors, a very warlike people; but when ſubdued by the Perſians, and enjoined by Cyrus, according to the advice given him by Crœſus, to wear long veſts, and to apply themſelves to ſuch arts only as had a natural tendency to debauch their manners, and enervate their courage, they became voluptuous and effeminate, unfit for action, and wholly given up to idleneſs, pleaſure, and diverſions. The ſoil of this country, watered by many rivers, was very fruitful; abounding with all ſorts of grain, and celebrated for its exquiſite wines. It was alſo enriched with ſeveral mines, whence Crœſus is ſaid to have drawn his immenſe wealth.

As to the religion of the Lydians, it ſeems to have been much the ſame with that of the Phrygians. They worſhipped Diana, Jupiter, and Cybele at Magneſia. The cuſtoms of the Lydians were ſimilar to thoſe of the Greeks, except that they uſed to proſtitute their daughters, who had no other fortune except what they earned in this way. They puniſhed idleneſs as a crime, and inured their children from their infancy to hardſhips. Their arms were not bows and arrows, but long ſpears anciently uſed by the cavalry; and if we may believe Herodotus, the Lydians far excelled all other nations in horſemanſhip. They were the firſt that introduced the art of coining gold and ſilver, for facilitating trade; the firſt that ſold by retail, that kept eating-houſes and taverns, and that invented public ſports and ſhows, which were therefore called *ludi* by the Romans, who borrowed them of the Tuſcans, the deſcendants of the Lydians. To theſe diverſions they recurred for relief at a time, during the reign of Atys, when a great ſcarcity of proviſions prevailed through the whole kingdom of Lydia. Having contrived various kinds of diverſions, as Herodotus informs us, they uſed to play one whole day without intermiſſion, eating and drinking the next day without other amuſement. After they had continued thus alternately faſting and feaſting, and finding that their calamities increaſed rather than abated, the king divided the whole nation into two bodies, commanding them to determine by lot, which of the two ſhould remain at home, and which ſhould go abroad in queſt of new habitations, ſince their native country could not afford them ſufficient maintenance. Thoſe who by lot were conſtrained to abandon their country, after many adventures, arrived in that part of Italy, which was then called Umbria, and is now named Tuſcany. Thus they changed their name, being no longer called Lydians, but Tyrrhenians, from their leader Tyrrhenus.

Although the trade of the Lydians is no where particularly mentioned, we may well imagine that it was conſiderable, eſpecially under their latter kings, when Lydia was in the meridian of its glory; on account of the ſplendour of this monarchy and the advantageous ſituation of the country. The ſame inference is juſtified by adverting to the immenſe riches, not only of the Lydian princes, but of ſeveral private perſons. Herodotus (lib. vii. c. 23.) mentions one, named Pythius, who not only entertained Xerxes and his whole army, while he was marching with innumerable forces to invade Greece, but made him an offer of 2000 talents of ſilver, and 3,993,000 pieces of gold, bearing the ſtamp of Darius. This ſame Pythius was reckoned the richeſt man in the then known world. The laſt king of Lydia was Crœſus (ſee his article), with whoſe capture by Cyrus at the ſiege of Sardis (B.C. 548.) the ancient kingdom of Lydia terminated; and from this time it continued ſubject to the Perſians, till they alſo were conquered by the Macedonians. Anc. Un. Hiſt. vol. iv.

LYDIAN, the name of one of the modes in Greek muſic, which occupied the middle place between the Æolian and Hypodorian. It was alſo ſometimes called the Barbarian mode, from its being invented by a people of Aſia. See Mode.

Euclid diſtinguiſhes two Lydian modes; that of which we have been ſpeaking, and another called a low Lydian, and which is the ſame as the Æolian mode, at leaſt as to its fundamental. The character of the Lydian mode was animated and intereſting, yet melancholy, pathetic, and proper for voluptuous occaſions; on which account Plato baniſhed it his republic. It was ſaid that by this mode Orpheus tamed wild beaſts, and that Amphion built the walls of Thebes. Some ſay that it was invented by Amphion, the ſon of Jupiter and Anthiope; others by Olympus the muſician, and diſciple of Marſyas; while there are ſtill others who aſſign it to Melampides. Pindar ſays, that it was firſt uſed at the nuptials of Niobe.

Lydian *Games*, was a name given to the exerciſes and amuſements invented by the Lydians: they are ſaid to have invented the quoit and games of chance, played with dice. Theſe Aſiatics, after they had loſt their city, emigrated into Etruria, whither they carried their ceremonies and games. Some Romans, having a paſſion for foreign play, adopted the Lydian method of gaming, which in the time of the emperors was purſued with ſuch exceſs, that Juvenal is very ſevere on the great number of thoſe who were haſtening to ruin by that means.

The Lydian games were at firſt called *Lydi* by the Romans, but afterwards, by corruption, *Ludi*.

Lydian *Lyre*, in the *Ancient Muſic*. The Trigon inſtrument or harp of the Aſiatics or Barbarians was uſually ſo called.

Julius Pollux, c. 10 of l. iv. Onomaſt. ſpeaks of a Lydian harmony, mode or tune, proper for the flute, of which he aſcribed the invention to Anthippus; and a little further, he ſays, that the Lydian nome proper for the flute was invented by Olympus or Marſyas.

For the ſcale and names or characters of the notes in the Lydian mode, ſee Music *of the Greeks*, and Notation. The Lydian mode correſponded with our key of E.

Lydian *Stone*; *Lydiſcher ſtein*, Wern.; *Baſanite*, Kirw.; *Pierre cornéenne* of ſome French mineralogiſts; vulgarly *Touch ſtone*, *Black jaſper*, &c.

Its colour is commonly greyiſh-black, which ſometimes approaches to blueiſh and velvet black.

It is found maſſive and in irregular blunt-edged rolled pieces, ſometimes traverſed by veins of quartz, which are however more frequently ſeen in the common flint-ſlate, of which the Lydian ſtone is conſidered to be a ſubſpecies.

Externally ſmooth and gliſtening; internally it is more or leſs glimmering. Its fracture is even, approaching to flat conchoidal, and alſo ſometimes to uneven and ſplintery; in the large it paſſes into ſlaty. Fragments indeterminately angular, moſtly ſharp-edged; they are opaque, ſeldom tranſlucent at the edges.

It is hard, but leſs ſo than quartz; brittle; not very eaſily frangible. Specific gravity 2.596, Kirwan; 2.880, Groſs; 2.887, Gerhard.

The Lydian ſtone is, like the common flint-ſlate, infuſible *per ſe*; and it generally retains its black colour in a very intenſe heat.

With regard to its geognoſtic ſituation it differs conſiderably from the common *Flint-ſlate* (which ſee); for it does not, like this, form entire mountains, but only ſingle ſtrata. Thus it occurs alternating in uniform ſtrata with primitive clay ſlate, in Saxony, Bayreuth, &c. To Mohs, however, it appears to be only the newer clay-ſlate formation which contains ſuch ſtrata; ſince the older clay ſlate of the lofty ridges of mountains in the Saxon Erzgebirge appears to be entirely deſtitute of Lydian ſtone. In ſecondary formations, ſuch as the greywacke mountains, it occurs partly as rolled pieces (being the products of a deſtroyed older formation), partly in beds in uniform ſtrata alternating with greywacke and greywacke ſlate: of this latter numerous examples occur in the Hartz mountains. Of the older formation of this rock, it is worth remarking that it occurs with traces of carbone.

The beds of Lydian ſtone, where they baſk out, appear very much rent, and divided into cubic maſſes; and, indeed, this cubic form is ſtill more or leſs diſcernible in the boulders and rolled pieces of this ſubſtance found in brooks and rivers. Mohs.

LYDIAT, Thomas, in *Biography*, an Engliſh mathematician, was born at Okerton, in Oxfordſhire, in 1572, and was educated at Wincheſter-ſchool, from whence he removed to New college, Oxford, where he obtained a fellowſhip. He applied himſelf with great aſſiduity to the ſtudy of the languages, philoſophy, aſtronomy, the mathematics, &c. In the year 1603 he reſigned his fellowſhip, and contented himſelf with living on his patrimonial eſtate. The next ſeven years he ſpent in publiſhing ſeveral books which he had begun in the college, particularly his "Emendatio Temporum ab initio mundi huc uſque compendio facta, contra Scaligerum." This work was dedicated to Henry, prince of Wales, who appointed him his chronographer and coſmographer. In 1609 he became acquainted with archbiſhop Uſher, who gave him a ſituation in the college at Dublin, which he held about two years. In 1612 he was preſented to the rectory of Okerton. He was a great ſufferer for his loyalty in the civil wars: at one time he was ſo completely ſtripped of all his property, that for three months together he was under the neceſſity of borrowing a ſhirt, to be able to change his linen. He was twice forced away from his own houſe, and once made a priſoner in Warwick caſtle. He died extremely poor in 1646, when he was about 74 years of age. In 1669 a ſtone, with an inſcription, was placed over his grave, at the expence of the fellows and wardens of his college: an honorary monument was likewiſe erected to his memory. He was a perſon of ſmall ſtature, but of great parts, and of a public ſoul: he was a man of conſiderable and various erudition, and held in high eſtimation by learned men both at home and abroad. He wrote a great number of books, beſides that already referred to, as 1. "De variis annorum formis," and a defence of the ſame in reply to Clavius and Scaliger. 2. "On the Origin of Fountains." 3. Several treatiſes on Philoſophy and Aſtronomy, &c. He left behind him a number of MSS.

LYDOWIARY, in *Geography*, a town of Samogitia; eight miles N.W. of Roſienne.

LYE, in *Agriculture*, any watery fluid much impregnated with ſaline matter. In huſbandry the term is generally applied to ſuch fluids as are employed for the purpoſe of ſteeping grain; in which caſes the beſt criterion of their ſtrength is that of the ſwimming of an egg. See Steep.

Lye, Edward, in *Biography*, a learned antiquarian, and great maſter of the Gothic and Saxon tongues, to whoſe labours we have had frequent occaſion to refer, was born at Totneſs, in Devonſhire, about the year 1694, where his father kept a ſchool. He was educated at home till he was about nineteen years of age, when he was admitted at Hertford college, Oxford: here he took his degrees, and in 1719 was ordained prieſt, and preſented to the living of Haughton-parva, in Northamptonſhire. In this ſituation he employed himſelf in the profound ſtudy of the Anglo-Saxon language. His firſt publication was an edition of the "Etymologicum Anglicanum" of Francis Junius, from the author's MS. in the Bodleian library. To this he prefixed an Anglo-Saxon grammar. In 1750 he was preſented to the vicarage of Yardley-Haſtings. After this he publiſhed the Gothic goſpels, with a Gothic grammar prefixed to them: but the great labour of the latter part of his life was his Anglo-Saxon and Gothic dictionary, which he had juſt finiſhed and put to preſs, when death terminated his labours in 1767. It was publiſhed under the direction of the Rev. O. Manning in 1772.

LYEMMER. See Leviner.

LYGDINUM Marmor. See Marble.

LYGDUS Lapis, in *Natural Hiſtory*, a name given by ſome of the ancients to the ſpecies of alabaſter, which others of them called *marmor lygdinum*, by which name there is only one ſpecies.

LYGE, in *Geography*, a town of Norway, near a lake of the ſame name; 16 miles N.W. of Chriſtianſand.

LYGEUM, in *Botany*, one of Loefling's genera, and ſo called from λυγος, *a rod* or *twig*, in alluſion to the tough pliant ruſhy nature of the plant. Loefl. It. 284. t. 2. Linn. Gen. 31. Schreb. 43. Willd Sp. Pl. v. 1. 316. Mart. Mill. Dict. v. 3 Ait. Hort. Kew. ed. 2 v. 1. 135. Juſſ. 33. Lamarck Illuſtr. t. 39. Richard in Sims and Kon. Ann. of Bot. v. 2. 548. t. 15 — Claſs and order, *Triandria Monogynia.* Nat. Ord. *Gramina.*

Gen. Ch. *Cal.* Glume of one ovate, convoluted, pointed, permanent valve, at length inflexed, ſeparating at the lower ſide, and containing two equal, oppoſite, parallel, level florets. *Cor.* of two valves, very hairy at the baſe, permanent; the outermoſt ovate, pointed, convex, awnleſs; inner twice as long, linear, narrow, acute, cloven at the ſummit, awnleſs. *Stam.* Filaments (in each floret) three, equal, longer than the corolla, flattiſh, very narrow, anthers vertical, linear, cloven at each end. *Piſt.* Germen ſuperior, oblong, convex at the outſide, flat at the inner; ſtyle ſimple, compreſſed, the length of the ſtamens; ſtigma ſimple, taper-pointed, incurved. *Peric.* none, except the hardened hairy baſe of the corolla of each floret, united longitudinally to the other. *Seeds* ſolitary, linear-oblong, convex at the outſide, flattiſh, with a longitudinal furrow, at the inſide.

Eſſ. Ch. Glume of one valve, convoluted, two-flowered. Corolla of two valves, the innermoſt twice as long as the outer, awnleſs. Seed ſolitary, encloſed in the hardened combined baſe of each floret.

1. L. *Spartum.* Baſtard Mat-weed. Linn. Sp. Pl. 78. (Sparta herba alterum; Cluſ. Hiſt. v. 2. 220. Spartum alterum Plinii; Ger. em. 41.)—The only known ſpecies obſerved by Loefling to be very abundant in the ſouth of Spain, always growing in low places, on a clay ſoil, where the water ſtands after much rain. The Spaniards call it *Albardin,* or *Alvardin,* a name probably retained from the Moors. The *root* is creeping and perennial. *Stems* about a ſpan high, erect, ruſhy, round, ſlender, ſmooth, nearly naked, with one joint, above which they are much extended after flowering. *Leaves* ſeveral, ſheathing the lower part of the ſtem, and about equal to it in height, narrow, convoluted, taper-pointed, ruſhy, ſmooth; the upper or floral one ſhorter, with a longer ſheath. *Stipula* thin, membranous, oblong, cloven, decurrent. *Flower* large, terminal, ſolitary, at firſt erect, inclining as the ſeeds ripen, with a knot at the baſe. *Calyx* ſmooth, delicately ſtriped with green, at length opening and expoſing the long denſe hairs which clothe the baſe of the permanent corolla, inveſting the ſeed.

The error of Linnæus and Loefling, who ſuppoſed the germen to be inferior, and common to two florets, is properly corrected by Richard, who ſhews the ſuppoſed two-celled nut to be formed merely of the hardened combined baſes of the corollas of the two florets. This is analogous to many other true graſſes, (as this is,) whoſe hardened corolla becomes a huſk or ſhell to the ſeed. In other points the deſcription of Richard is ſcarcely, if at all, ſuperior to that of Loefling.

This plant, being far inferior in tenacity, as well as length, to the true *Spartum* or Mat-weed, *Stipa tenaciſſima* of Linnæus, ſerves chiefly in Spain for ſtuffing mattraſſes. It flowers in May and June, ripening ſeed in autumn, and often retaining its empty ſheath or calyx till the following ſummer. The parts of fructification are, on the whole, perhaps larger than thoſe of any other graſs.

LYGINIA, from λυγινος, *twiggy,* alluding to its hard tough ruſhy habit. Brown Prodr. Nov. Holl. v. 1. 248. (Schoenodum; Labillard. Nov. Holl. v. 2. 79.)—Claſs and order, *Dioecia Monadelphia.* Nat. Ord. *Tripetaloideæ,* Linn. *Junci,* Juſſ. *Reſtiaceæ,* Brown.

Eſſ. Ch. Male, Spatha of one valve. Petals ſix. Filaments united lengthwiſe. Anthers three, didymous, cloven at each end.

Female, Spatha of one valve. Petals ſix. Style in three deep diviſions. Capſule three-lobed, three-celled, burſting at the prominent angles. Seeds ſolitary.

The root is ſcaly, creeping, with thick downy fibres. Stems ſimple, round, leafleſs, with ſeveral ſheathing ſcales, eaſily breaking at the joints. Spike terminal, of ſeveral crowded tufts of flowers, each accompanied by a common ſheathing bractea, the female flowers ſometimes ſolitary.

1. L. *imberbis.* Bracteas and ſpathas beardleſs. Male and female tufts many-flowered.—Native of the ſouth part of New Holland.—This is *Schoenodum tenax,* the male plant, of Labillardiere, t. 229. f. 1. Mr. Brown obſerves, that this ſuppoſed ſpecies of the French author is made up of two different genera; he therefore thinks it ſafer to reject the generic name entirely, than to retain it for either the male or female plant, which might lead to error. To this determination we gladly aſſent, eſpecially as the ſaid name, being compoſed of another eſtabliſhed one, *Schoenus,* is abſolutely inadmiſſible, and its termination being altered for the worſe from *Schoenoides,* (which the author gives as his meaning) not in any manner removing the objection.

2. *L. barbata.* Bracteas and ſpathas bearded. Male tufts of few flowers; female ones ſingle-flowered, nearly ſolitary. From the ſame country. Theſe plants have much of the habit of *Reſtio, Elegia,* &c. See Lepyrodia.

LYGISMOS, from λυγιζω, *to diſtort,* in *Surgery,* a diſtortion of the limbs; ſometimes a luxation.

LYGMOS. See Hickup.

LYGODIUM, in *Botany,* from λυγωδης, *pliant, tough,* and *ſlender,* expreſſive of the habit of this elegant genus, which conſiſts of ferns with twining ſtems. Swartz Syn. Fil. 152. Sim's and Konig's Annals, v. 2 305. t. 1. f. 2. Sprengel Crypt. 176. t. 5. f. 39. Brown Prodr. Nov. Holl. v. 1. 162. Bernhardi in Schrad. New Journ. v. 1. faſc. 2. 39. t. 3. (Ugena; Cavan. Leccion. 551. Hydrogloſſum; Willd. Abhandl. 20. t. 1, 2. Odontopteris; Berhardi in Schrad. Journ. for 1800. 127. t. 2. f. 4. Giſopteris; ibid 129. t. 2. f. 1. Ramondia; Mirbel Bull. des Sciences an 9. 179.)—Claſs and order, *Cryptogamia Filices.* Nat. Ord. *Filices,* Linn. Juſſ. *Filices Oſmundaceæ,* Brown.

Gen. Ch. *Capſules* without a ring, ovate, reticulated with veins, pellucid, radiated with furrows at the top, burſting lengthwiſe, ſeſſile, reverſed, attached by their middle, in two rows, on narrow proceſſes of the frond at its back, forming little, ſimple or forked, ſpikes. *Involucrum* conſiſting of ſeparate ſcales, alternate with the capſules, originating from the veins of the frond, unconnected at their upper part.

Eſſ. Ch. Capſules ſeſſile, ovate, attached by their middle, reverſed, radiated at the top, in two rows on the back of narrow proceſſes of the frond. Involucrum of ſolitary ſcales, ſeparating the capſules.

Obſ. Mr. Brown has firſt remarked the great peculiarity of the inſertion of the capſules, they being attached by their middle, not by their baſe. The ſtem is long, twining, and climbing. Leaves in pairs, on one common cloven footſtalk, each of them either divided or compound. Fructification either fringing their lobes in the form of minute, pale, chain-like ſpikes, or rarely compoſing the whole of certain leaves, transformed as it were into a compound forked aſſemblage of ſpikes. See Willd. t. 1. f. 2.

Swartz defines eleven ſpecies, to which Mr. Brown adds a twelfth, found in the tropical region of New Holland, which he calls *L ſemibipinnatum.*

Beautiful ſpecimens are

L. *ſcandens.* Sw. n. 1. (Ophiogloſſum ſcandens; Linn. Sp. Pl. 1518. Ugena ſemihaſtata; Cav. Ic. v. 6. 74. t. 594. f. 1. Adiantum volubile minus; Rumph. Amb. v. 6. 75. t. 32. f. 2, 3. Filix; Petiv. Gazoph. t. 64. f. 11.)—Stem round. Fronds pinnate. Leaflets ſtalked, oblong; heart-ſhaped or lobed at the baſe: the barren ones finely ſerrated.—Native of the Eaſt Indies, and of Brazil. This riſes to the height of ſeveral feet.—The *fronds* or branches ſpring in pairs from a woolly-topped knob, and are each a ſpan long, of about eight or ten alternate, ſtalked, oblong leaflets, with an odd terminal one of larger ſize. Each is fringed with numerous ſhort, rather hairy, ſpikes.

L. *circinnatum.* Sw. n. 6. (Ophiogloſſum circinnatum;

Burm. Ind. 228. O. flexuoſum; Linn. Suppl. 443, not Sp. Pl. 1519. Adiantum volubile polypoides, ſive majus; Rumph. Amb. v. 6. 75. t. 33.) — Stem round. Fronds palmate, in three or four lanceolate entire taper-pointed lobes; the fertile ones much contracted.—Native of the Eaſt Indies. We have it from Tranquebar.—The *leaves* are deeply palmate, ſmooth, entire, pale green. *Spikes* marginal, very ſhort, almoſt round.

Linnæus confounded this with the *Valli-panna*, Hort. Malab. v. 12. 63. t. 32, which ſeems to be his real *O. flexuoſum*, and is *Lygodium flexuoſum* of Swartz, n. 5.

LYGON and Lygus, are uſed for agnus caſtus.

LYGUM, in *Geography*, a town of Denmark, in the duchy of Sleſwick; 14 miles W. of Apenrade.

LYING-IN Hospital. See Hospital.

Lying-in *Women, Diſorders of.* See Labour, Lochia, Fever, After-pains, &c.

Lying-in *Women, Treatment of.* See Labour.

Lying *under the Sea*, in *Sea Language*, is when, in a ſtorm, the ſhip is a-hull, and the helm ſo faſtened a-lee, that the ſea breaks upon her bow, or broadſide.

Lying *along*, denotes the ſtate of a ſhip, when preſſed down ſideways by a weight of ſail in a freſh wind that croſſes the ſhip's courſe either directly or obliquely.

Lying-*to*, or *Lying-by*, denotes the ſituation of a ſhip when ſhe is retarded in her courſe, by arranging the ſails in ſuch a manner, as to counteract each other with nearly an equal effort, and render the ſhip almoſt immoveable, with reſpect to her progreſſive motion or head-way.

A ſhip is uſually *brought-to* by the main or fore-top-ſails, one of which is laid a-back, whilſt the other is full; ſo that the latter puſhes the ſhip forward, whilſt the former reſiſts the impulſe, by forcing her a-ſtern. This is particularly practiſed in a general engagement, when the hoſtile fleets are drawn up in two lines of battle oppoſite to each other: it is alſo uſed to wait for ſome other ſhip, either approaching or expected; or to avoid purſuing a dangerous courſe, eſpecially in dark or foggy weather, &c. Falconer.

Lying-*to in a Storm.* See Trying

LYKSBORG, or Luxburg, in *Geography*, a town of Denmark, in the duchy of Sleſwick, on a promontory near the Baltic; 7 miles N.E. of Flenſborg.

LYKSALE, a town of Sweden, in the Lapmark of Umea; 80 miles S.S.W. of Umea

LYMAN, a townſhip of America, in Grafton county, New Hampſhire, ſituated at the foot of a mountain on the eaſt ſide of Connecticut river, between Littleton and Bath, 7 miles W. by N. of New Concord; incorporated in 1761, and containing 533 inhabitants.—Alſo, a town in the county of New York, Maine, north of Wells and eaſt of Alfred, to each of which it adjoins.

LYME, a town of Grafton county, New Hampſhire.—Alſo, a poſt-town in New London county, Connecticut, the "Nehantick" of the Indians, at the mouth of the Connecticut river, on its eaſt ſide; ſettled about the year 1664, and incorporated in 1667; and containing, in three pariſhes, 4380 inhabitants.

LYME REGIS, a ſea-port, borough, and market-town, in the hundred of Whitchurch, in Bridport diviſion of Dorſetſhire, England, is ſituated 23 miles diſtant from Dorcheſter, and 143 from London, on the little river Lyme, near the ſea. Its ſituation, in a cavity between two rocky hills, on a declivity, makes it difficult of acceſs; and that part of the town neareſt to the ſea is ſo very low, that at ſpring-tides the under-rooms and cellars are overflowed to the depth of ten or twelve feet. Lyme is mentioned in hiſtory in the eighth century, when Cenwulf, king of the Weſt Saxons, granted, in a charter to the church of Sherborne, "the land of a manſion near the weſt bank of the Lim, ſo that ſalt for the ſaid church ſhould be boiled there." In the Domeſday Survey we find the manor of Lyme as being in three diviſions or parcels. Edward I. granted Lyme the liberties of an haven and borough; and from that period it increaſed in buildings, and became ſo proſperous, that it was able to furniſh Edward III. with four ſhips, and ſixty-two mariners, for the ſiege of Calais. In the reigns of Henry IV. and V., the ſouthern coaſt of England was much annoyed by the incurſions of the French: this town ſeverely experienced their effects; and being alſo afflicted by other caſualties, its trade declined conſiderably. It has ſince been occaſionally retrieved and reduced; but is now recovering its importance through the reſidence of merchants, who have recently erected ſome handſome ſtone-houſes; and as the harbour is conſidered one of the beſt in England, the town is capable of great improvement. During the civil war in the reign of Charles I., Lyme was a place of great conſequence to the contending parties, eſpecially to the royaliſts; great part of their dependence on the weſt of England ariſing from being in poſſeſſion of this town. The ſiege of Lyme was one of the moſt remarkable that occurred during that eventful period. In the reign of James II., Lyme was diſtinguiſhed by the landing of the duke of Monmouth here on his unfortunate contention for the kingdom, and by the ſanguinary executions which took place on his defeat.

The privileges granted by Edward I. to this town have been confirmed and increaſed by ſeveral ſucceeding ſovereigns. The corporation conſiſts of a mayor, who acts as a juſtice in the years before and after his mayoralty, a recorder, town-clerk, and fifteen capital burgeſſes, of whom two with the mayor are juſtices. The royalty of the manor is veſted in the corporation. Lyme has been repreſented in parliament ever ſince the twenty-third year of Edward I. The right of election is in the mayor, burgeſſes, and freemen; the voters being between thirty and forty. The church is a neat, though ancient edifice, but is not particularly worthy of notice. The cuſtom-houſe is a modern brick building, ſupported on pillars, for the convenience of the corn-market, which is held beneath. The quay is commodious, though not ſpacious; and round the harbour are ſeveral ſmall forts mounted with cannon for its defence. The principal public work, however, is the cobb, or pier, which, in its ancient ſtate, was compoſed of vaſt pieces of rocks rudely piled on each other; but is now formed of ſtone. This is a fabric of the greateſt utility on this coaſt, there being no other ſhelter for ſhipping between the Start point and the Portland road; and although at this place the ſouth-weſt wind blows with extreme violence, veſſels ride in the harbour in perfect ſecurity. The cobb has ſuffered very much by theſe winds: it was totally deſtroyed in the reign of Richard II.; and in the laſt century it ſuſtained great injury by three ſtorms, but was repaired by government at the expence of 6000*l.* Charles II. granted 100*l.* *per annum* towards its repair, out of the cuſtoms of the port, which is ſtill continued; and the inhabitants annually chuſe two cobb wardens to ſuperintend the improvement. The population of this town, in the year 1801, was ſtated to be 1451; the number of houſes, which are chiefly conſtructed of blue rag-ſtone, and covered with ſlate, was 276. A market is held on Saturdays, and two fairs annually.

Lyme was the birth-place of Thomas Coram, the benevolent patron and contriver of the Foundling hoſpital in London. He died March 19, 1751, in his eighty-fourth year, and was buried in the vault under the chapel of the hoſpital, where an inſcription perpetuates his memory. Beauties of England and Wales, vol. iv. Hutchins' Hiſtory and Antiquities of Dorſetſhire, 2 vols. folio.

LYMFIORD, or Lymfurt, a gulf of Denmark, near the weſt coaſt of North Jutland, communicating with the Cattegat, and running 80 miles inland, gradually widening, and ſeparated from the North ſea only by a narrow ſtrip of land. N. lat. 56° 39'.

LYMINGTON, a borough and market-town in the pariſh of Boldre, in the New Foreſt of Hampſhire, England, is ſituated on the declivity of a riſing ground, on the eaſtern bank of the Lymington river, about a mile from its confluence with the ſea; at the diſtance of 16 miles from Southampton, and 95 from London. It is of remote, though unknown origin: from a conſideration of local circumſtances, Mr. Warner ſuppoſes that a town or village was formed near this ſpot by the Britons. That the Romans were acquainted with it, is evinced by the contiguity of an encampment called Buckland Rings, or Caſtle Field, and by the evidence of Roman coins, nearly 200lbs. weight of which, of the Lower Empire, were diſcovered here in two urns in the year 1744. Lymington occurs in Domeſday book under the name of Lentune: but it does not ſeem to have attained any conſiderable importance till it became the property of baron de Redvers, in the time of Henry I.; when, a port being eſtabliſhed, the wines of France, and other foreign commodities, were unſhipped at its quays. It then alſo became famous for its ſalt-works; though this manufacture is, with great probability, ſuppoſed to have been eſtabliſhed at a much earlier period. A very extenſive manufacture of marine ſalt is now carried on here: the works are ſituated on the borders of the ſea-ſhore, and reach nearly three miles in a ſouth-weſt direction. The town conſiſts principally of one long ſtreet, and is divided into the *new* and *old* town by the church, which, though originally a regular pile, conſiſting of a nave, chancel, and aiſles, with a ſpire in the centre, is now, through ſucceſſive alterations, become extremely informal. The town hall is a neat building: and here are two ſets of baths, which are rendered very convenient, and are much frequented. Lymington was ſummoned as a borough to ſend repreſentatives to parliament in the reign of Edward III.: but it does not appear to have complied with this precept till the 27th of Elizabeth. In the reign of James I. it was incorporated by charter, and from that period the returns have been regular. The right of election is veſted in the mayor and burgeſſes, in number about eighty. The population was ſtated, under the act of the year 1800, to be 2378; the houſes 492. A market is held on Saturdays; and two fairs annually. The ſituation of Lymington, on the banks of a navigable river, and ſo contiguous to the ſea, is extremely favourable for trade; but this advantage was formerly much greater than at preſent, as, by the injudicious conſtruction of a cauſeway, the depth of the river has been conſiderably leſſened, and its channel contracted. Previous to the making of this cauſeway, which was about the year 1730, veſſels of upwards of 500 tons burthen could be brought up to the quay; though now one of 300 tons can ſcarcely be navigated. Beauties of England and Wales, vol. vi. Warner's Account of Lymington, 12mo.

LYMPHA, Lymph, in *Anatomy*, a term given to the tranſparent fluid conveyed in the abſorbing veſſels of the body; alſo to a part of the blood. (See Absorption and Blood.) It is often applied alſo to other animal fluids, chiefly when clear and nearly tranſparent.

LYMPHÆ Ductus, a name given ſometimes to the lymphatic veſſels.

Lymphæ, among the *Romans*, a kind of grottoes, or artificial caves, ſo called from *lympha, water*; becauſe they were furniſhed with a great many tubes, canals, and ſecret paſſages, through which the water ſuddenly guſhed upon the ſpectators, while buſy in admiring the great variety and beautiful arrangement of ſhells, with which the grotto was adorned.

LYMPHATI, or Lymphatici, in *Antiquity*, a name given by the Latins to poſſeſſed or mad perſons, becauſe they were thought to be gifted with divination. Plin. Nat. Hiſt. lib. xxv. cap. 5. p. 368. edit. Hard. See Larvati.

Theſe anſwer to the νυμφοληπτοι of the Greeks: the ancient Greeks called water *nympha*, which the Latins changed into *lympha*. The term *omphi*, ſays Mr. Bryant, is of great antiquity, and denotes an oracular influence, by which people obtained an inſight into the ſecrets of futurity: it was written *omphi* or *amphi*, and ſignified the oracle of Ham, who, according to the Egyptian theology, was the ſame as the ſun, or Oſiris: and as fountains were deemed ſacred, theſe were ſtyled by the Amonians *Ain omphe*, or the fountains of the oracle, from the divine influence with which they were ſuppoſed to abound, which terms were afterwards contracted by the Greeks into νυμφη, *a nymph*, who ſuppoſed ſuch a perſon to be an inferior goddeſs who preſided over waters. In the ſame manner from *al omphia* was derived *lympha*, which differed from aqua or common water, becauſe it was of a ſacred or prophetic nature. Analyſis of Ant. Myth. vol. i. p. 280.

LYMPHATICS, in *Anatomy*, are the abſorbing veſſels. This ſyſtem is an aſſemblage of numerous ſmall veſſels, ariſing from all parts of the body, carrying from them various fluids, which they pour into the venous ſyſtem, after making them paſs through certain ſmall bodies called lymphatic glands, and forming part of the ſame ſyſtem with them. The term lymphatics was applied to theſe tubes in conſequence of their containing, in general, a tranſparent fluid or lymph; and it deſignates, therefore, properly ſpeaking, only thoſe abſorbents, of which the contents reſemble lymph. The veſſels, which take up the chyle from the inteſtines, are called lacteals, from the appearance of their contents. As the ſtructure and offices of the organs are the ſame in all parts, theſe diſtinctions might lead to erroneous views of the ſubject; and the term abſorbents, which denotes their general function, ſeems the moſt appropriate. Names derived from the nature of the fluid abſorbed are more particularly objectionable, becauſe that is very imperfectly known to us. We cannot ſuppoſe that one and the ſame fluid is abſorbed from ſerous cavities, from the adipous cells, from muſcles, glands, bones, &c.; yet in all theſe caſes it goes under the common and very indefinite term lymph.

Like the termination of the exhalants, the origin of the abſorbents cannot be demonſtrated. They are ſo extremely delicate, that the eye, aſſiſted even by the beſt optical inſtruments, cannot diſcern them: we muſt therefore infer their exiſtence from phenomena, and conclude that abſorbing veſſels ariſe wherever abſorption takes place. An attentive examination of abſorptions ſhews us that they occur wherever there is exhalation; ſo that the ſame table may ſerve both for exhalants and abſorbents. The following one repreſents the latter.

Abſorbing veſſels.

- 1. External, ariſing on
  - 1. The mucous ſurfaces.
  - 2. The ſkin.
- 2. Internal, ariſing on
  - 1. The ſerous ſurfaces.
  - 2. The cellular ſyſtem; and deriving from it
    - 1. Serum.
    - 2. Fat.
  - 3. The medullary ſyſtem
    - 1. Of ſhort and broad bones; and the extremities of long bones.
    - 2. Of the middle of long bones.
  - 4. The ſynovial ſyſtem
    - 1. Of the joints.
    - 2. Of tendinous ſheaths.
- 3. Of nutrition, taking up the reſidual nutritive matter of each organ.

The ſtructure, properties, functions, and diſtribution of the abſorbing ſyſtems, both the veſſels and glands, are conſidered in detail in the articles ABSORBENTS and ABSORPTION.

LYMPHATICS *of Birds and Fiſhes*. See *Anatomy of* BIRDS and FISHES.

LYNCHBURG, in *Geography*, a poſt-town of Virginia, in Bedford county, on the S. ſide of James river, nearly oppoſite to Maddiſon, and one mile diſtant. It contains about 100 houſes, and a large warehouſe for the inſpection of tobacco; 12 miles from London.

LYNCHET, among *Farmers*, a line of green ſward, ſerving as a boundary to ſeparate ploughed land, in common fields. See BALKS.

LYNCHVILLE, in *Geography*, a poſt-town of Marion county, South Carolina, 450 miles from Waſhington.

LYNCIS LAPIS, in *Natural Hiſtory*, the name given by ſome of the writers of the middle age to the *belemnites*.

LYNCURIUM, or LYNCURIUS, in *Mineralogical Antiquities*, a mineral ſubſtance, reſpecting the nature of which ſeveral conjectures have been broached, from the time of Pliny down to the preſent day. The opinions of the preſent mineralogiſts appear to be divided between amber and hyacinth; but it is moſt probable that both theſe ſubſtances have been confounded under the name of lyncurium. Pliny, in ſpeaking of the mineral in queſtion, is inclined to deny its very exiſtence: "De lyncurio," he ſays "maxime dici cogit auctorum pertinacia. Quippe etiamſi electrum id eſſet, lyncurium tamen gemmam eſſe contendunt. Fieri autem ex urina quidem lyncis, ſed congeſta terra protinus beſtia aperiente eam, quoniam invideat hominum uſui. Eſſe autem qualem in igneis ſuccinis, colorem, ſcalpique. Nec folia tantum aut ſtramenta ad ſe rapere, ſed æris etiam ac ferri laminas, quod Diocles quidem et Theophraſtus credidit. *Ego falſum id totum arbitror*, nec viſam in ævo noſtro gemmam ullam ea appellatione." (Hiſt. Nat. xxxvii. 3.) It is remarkable that Pliny, whoſe incredulity upon other occaſions was certainly not over great, ſhould have treated the whole of what has been ſaid of the lyncurium as a mere fable, when his ſcepticiſm might have more properly been confined to that part of the ſtory which relates to the origin of the ſubſtance in queſtion. Inſtead of this, in ſpeaking of the lynx, he actually gives credit to what has been ſaid of the extraordinary quality of its urine. "Lyncum humor (he ſays) ita redditus ubi gignuntur glaciatur, areſcitve in gemmas, carbunculis ſimiles, et igneo colore fulgentes, lyncurium vacatas, atque ob id ſuccino a pleriſque ita generari prodito." Ib. viii. 38.

Theophraſtus, from whom Pliny has principally derived his information reſpecting lyncurium, mentions among its qualities that of attracting, like amber, particles of ſtraw, and even thin laminæ of copper or iron. Our hyacinth does not poſſeſs the quality of becoming electric by friction; a circumſtance to which ſir John Hill does not advert in his obſervations on this ſtone, which he conſiders as the only one that can be ſaid to anſwer the deſcription given of the lyncurium by Theophraſtus. On the other hand, it muſt be confeſſed that its remaining qualities, as mentioned by the Ereſian philoſopher, *viz.* the conſiderable hardneſs attributed to it, and the conſequent uſe made of it for engraving ſeals on, do not exactly ſquare with the well known characters of amber, which is moreover ſeparately deſcribed in his work as a ſubſtance perfectly diſtinct from lyncurium.

It is more than probable, that in this caſe, as in many others, the qualities of two diſtinct ſubſtances have been erroneouſly combined by the ancients, who, in their attempt to identify natural bodies, were but too often ſtrangely miſled by a fancied ſimilarity of characters, where the eye of a modern naturaliſt would ſcarcely diſcover traces of the moſt diſtant reſemblance.

It would appear that the fineſt amber, and a particular deep-coloured variety of it, was formerly obtained from Liguria, where, indeed, it ſtill occurs, though not in the ſame quantity in which it is found on the ſea-coaſt of Pruſſia. If we may ſuppoſe the word *licurium* to have been derived from that part of Italy, it is certainly equally probable that ignorance and the love of the marvellous may afterwards have ſubſtituted that of *lyncurium*, implying the fabulous origin of this ſubſtance from the urine of the lynx. Similarity of colour appears to have been ſufficient afterwards to affix the ſame appellation to the hyacinth; and it is probably this confuſion which produced the deſcription of Theophraſtus above alluded to, and which is partly applicable to amber, and partly to the hyacinth, or any other hard ſtone of ſimilar colour and tranſparency, ſuch as yellow garnets, yellow calcedony, &c.

Among the authors who have conſidered amber to be the lyncurium of the ancients, are Geoffroy, Geſner, Beckman, and Napione; moſt of the other modern writers on mineralogy follow St. Epiphanius, Leſſer, and Hill, who are decidedly of opinion that the hyacinth alone could have been meant by it. Sir William Watſon ſuppoſes that Theophraſtus's tus's deſcription is applicable to the tourmalin, the electrical phenomena of which are however of a peculiar nature ; not to mention other objections that may be urged againſt the identity of the two ſubſtances.

Of other opinions on this ſubject none deſerve to be mentioned, except, perhaps, on account of its ſingularity, that of Woodward, and ſome writers before and after him, who ſuppoſed the lyncurium to be the calcareous petrifaction known by the name of *belemnites.* Indeed it is difficult to gueſs what can have given origin to this ſtrange ſuppoſition, unleſs it be the circumſtance that theſe belemnites, when burnt, are ſaid to give out an unpleaſant urinous odour.

In the Vulgate, mention is made of the ligurius, as one of the twelve precious ſtones in the breaſt plate of the high prieſt. In the verſion of the Septuagint, it is called Λυγκούριον. St. Epiphanius, enumerating the ſame twelve gems, gives the following account of the ſtone in queſtion : "Ligurius vel lyncurius gemma ; de hujus inventione vel apud naturæ indagatores, vel apud alios veteres qui harum rerum meminerunt, nihil cognovimus. Invenimus tamen languriam gemmam vocatam, quam vulgari lingua lagurium appellant. Et forte puto hunc eſſe lygurium." (St. Epiph. Opp. latine.) The ſame writer and Hieronymus ſuſpect the lyncurium to be the hyacinth ; but how unſettled the ideas of St. Epiphanius were reſpecting the latter gem, appears from the following account he gives of it : "Hyacinthus igitur diverſas habet formas ; quo enim reperitur colore profundior, eo cæteris præſtantior eſt. Similis eſt lanæ quæ ſubpurpuraſcit aliquatenus." (l. c. pag. 110.)

LYNDEBOROUGH, in *Geography*, a townſhip of America, in Hillſborough county, New Hampſhire, about 70 miles from Portſmouth ; incorporated in 1764, and containing 976 inhabitants.

LYNDHURST, a village in the pariſh of Minſted, in the New Foreſt of Hampſhire, England, is ſituated nine miles from Southampton and 86 from London, nearly in the centre of the New Foreſt, of which it has been, from the formation of the foreſt, conſidered as a ſort of capital : and here was exerciſed the juriſdiction of the chief juſtice in eyre for this foreſt, ſo long as he continued to exerciſe it, of which there are no traces ſubſequent to the reign of Charles II. All the Foreſt courts under the verderors are ſtill held here ; as well as thoſe of attachment, &c. as the ſwanimote : the former are held on ſuch days as the preſiding judges appoint, three times in a year ; the latter on the 14th of September annually. The king's houſe, in this village, though but an indifferent reſidence, is occupied by the lord warden whenever he viſits the Foreſt. An ancient ſtirrup is preſerved here, ſaid to have been worn by William Rufus at the time he was ſhot by ſir Walter Tyrrell. The king's ſtables are very large, and were probably conſidered as magnificent when firſt erected, which appears to have been about the time of Charles II. From the hotel at Lyndhurſt, which is entirely new built, and fitted up with every convenience, is a fine view of the ſea, and of the Needle rocks at the weſt end of the Iſle of Wight. Under the population act of 1800, Lyndhurſt was returned as containing 181 houſes, inhabited by 882 perſons.

About one mile weſt of Lyndhurſt is Cuffnells, the ſeat of the right honourable George Roſe, who has been here honoured with two viſits from their majeſties and the royal family in the years 1801 and 1804. Beauties of England and Wales, vol. vi. Gilpin's Obſervations on the New Foreſt, &c. 2 vols. 8vo.

LYNDON, a townſhip in Caledonia county, Vermont, N. of St. Johnſburg, and S. of Burke and Billymead ; containing 622 inhabitants.

LYNN, Sagus of the Indians, a maritime poſt-town of America, in Eſſex county, Maſſachuſetts, on a bay, N.E. of Boſton bay, and about nine miles N. by E. from the town of Boſton. The townſhip was incorporated in 1637, and contains 2837 inhabitants. In this townſhip are two pariſhes, beſides a ſociety of Methodiſts, and a large number of Friends. The principal manufacture is that of women's ſilk and cloth ſhoes, which are ſold for home uſe, and ſhipped to the ſouthern ſtates and to the Weſt Indies. Lynn beach, which is a mile in length, connects the peninſula, called "Nahant" with the main land. In the ſummer ſeaſon it is a place of great reſort from neighbouring towns, and uſed as a race-ground.

Lynn *River*, a river of Norfolk county, in Upper Canada, which riſes in Windham townſhip, and diſcharges itſelf into lake Erie, affording a good harbour for batteaux.

Lynn *Canal*, an inlet on the W. coaſt of North America, and upper arm of Croſs ſound ; extending about 60 miles N. from the N. extremity of Chatham Sound ; ſo named by Capt. Vancouver, from Lynn, the place of his nativity. The entrance to the S. is in N. lat. 58° 12′. E. long. 225° 12′.

LYNNFIELD, a townſhip of America, in Eſſex county, Maſſachuſetts, N.E. of Salem, and 15 miles N. by E. from Boſton ; incorporated in 1782, and containing 468 inhabitants.

LYNNHAVEN Lake, a bay at the S. end of Cheſapeak bay, into which Lynnhaven river diſcharges its waters ; lying between the mouth of James's river and cape Henry.

LYNN-REGIS, or King's Lynn, a large reſpectable ſea-port, borough, and market town, in the hundred of Freebridge Lynn, in the county of Norfolk, England, is ſituated ten miles from the Britiſh ocean, on the eaſtern bank of the Great Ouſe river, which at this place is nearly the breadth of the Thames above London bridge. Lynn is diſtant from Norwich 44 miles, and from London 96. It is written Lun and Lena in Domeſday book ; and appears to have been, at the time of that ſurvey, a place of ſome conſequence and trade. Previous to the reign of Henry VIII. it was called Biſhop's Lynn, but falling into the poſſeſſion of that monarch he changed its name to Lynn Regis. The town is nearly one mile and a quarter in length ; its greateſt breadth being half a mile. Four ſmall rivers, called Fleets, divide it into ſeveral parts, which are connected by eleven bridges. The whole is encompaſſed on the land ſide by a deep wet foſs, flanked by a wall, which was formerly defended by nine baſtions, but is now in a dilapidated ſtate. At the north end is a platform battery, called St. Anne's port, mounted with ten eighteen pounders, which were planted here in 1627. Great improvements have been recently made in the ſtreets and avenues of the town.

Lynn has had fifteen charters granted to it by various ſovereigns of England. It was firſt incorporated by king John ; and has ſent two burgeſſes to parliament ever ſince the twenty-ſixth year of Edward I. The right of election is veſted in the freemen and free burgeſſes, in number about 330. The corporation conſiſts of a mayor, recorder, twelve aldermen, and eighteen common council-men. By the population ſurvey, made in the year 1800, the number of houſes was 2012, occupied by 10,096 perſons.

The town contains ſeveral public buildings, ſome of which exhibit curious ſpecimens of architectural antiquity. The principal is the church of St. Margaret, which, with a priory, was founded by Herbert, biſhop of Norwich, in the time of William Rufus. It was a very ſpacious ſtructure, and though now curtailed of its original dimenſion is ſtill a large and noble pile. It conſiſts of a nave with aiſles, a chancel or choir with aiſles, a tranſept, and two towers at the weſt end; the roof is ſupported by twenty-two columns, which ſeparate the body from the aiſles. At the eaſtern extremity of the town is an ancient edifice, called the Lady's or the Red Mount chapel; which conſiſts of an octagonal wall of red brick, and is conſtructed on a very ſingular plan. Within this is a handſome cruciform chapel, ſeventeen feet in length, fourteen in breadth, and thirteen in height; the roof is formed of ſtone, with numerous groins, &c. exactly reſembling the ceiling of King's college chapel, Cambridge. This curious ſtructure is verging to decay. St. Nicholas's chapel, built about the time of Edward III., is 200 feet in length, 78 in breadth, and 170 feet from the foundation to the top of the tower. The body conſiſts of a nave ſeparated from the aiſles by ten ſlender columns on each ſide, ſupporting an equal number of acutely pointed arches: the roof is groined, and the entrance doors are finely carved. A large monument of white marble commemorates ſir Benjamin Keene, K.B. a native of this town, and many years ambaſſador to the court of Madrid, in which city he died, Dec. 15, 1757; his remains were brought here for interment. The eaſt and weſt windows of this chapel are large, and are both adorned with numerous mullions and tracery. The ſouthern porch is profuſely ornamented with tracery, niches, &c. A view and plan of this porch, with plan, views, ſection, &c. of the Red Mount chapel, alſo hiſtorical and deſcriptive accounts of the two buildings, are publiſhed in Britton's Architectural Antiquities of Great Britain, vol. iii.

The chapel of St. James, after the diſſolution, being in a ruinous condition, was rebuilt in 1682, and converted into an hoſpital for fifty poor people. Great additions have ſince been made to the building, and it is now the general workhouſe for the town. The Exchange, or Cuſtom houſe, which was erected in 1683 by ſir John Turner, knt. is a neat freeſtone building, with two tiers of pilaſters, the lower in the Doric, and the upper in the Ionic order; it occupies the ſcite of an old religious houſe, which was appropriated to the Trinity guild. Several other religious eſtabliſhments were founded here, of which few veſtiges remain, except an hexagonal ſteeple, belonging to the monaſtery of the Grey friars, which ſerves as a good land-mark to veſſels entering the harbour. Two markets are held on Tueſdays and Saturdays, in different places: the Tueſday market-place compriſes an area of three acres, ſurrounded by ſome good houſes; near the centre, on an aſcent of four ſteps, ſtands a building, called the Market-croſs, of freeſtone, erected in the year 1710; the lower part is encompaſſed by a periſtyle formed by ſixteen Ionic columns; the upper part is finiſhed with a cupola, and the whole is ſeventy feet in height. The Saturday market is kept in a convenient area recently opened near St. Margaret's church-yard. The Guildhall is an ancient ſtructure of ſtone and flint; it contains a large ſtone hall, courts for the adminiſtration of juſtice, and three ſpacious aſſembly rooms. On the firſt Monday in every month, the mayor, aldermen, magiſtrates and clergymen meet, to hear and determine all controverſies between the inhabitants, in an amicable manner, for the prevention of law-ſuits. This laudable practice originated in the year 1558, and is called the Feaſt of Reconciliation. This town, not having any freſh ſprings, was formerly much diſtreſſed for water; but it is now ſupplied from a river near Gaywood, whence the water is conveyed by ſmall canals, to the conduits in the town.

Lynn harbour is deep, but the anchorage is bad, from the oozy bed of the river. It is capable of receiving three hundred ſail of ſhipping. At what time it was firſt uſed as a haven is not aſcertained: but ſubſequent to the reign of Henry III. Lynn aſpired to commercial conſequence, gradually roſe from its primitive obſcurity, and progreſſively became a conſiderable port. Its ſituation, ſo near the North ſea, and the inland navigation connected with it, gives the town great commercial advantages. It is open to a communication with all the north of Europe; and, by means of the Ouſe and its collateral rivers, can extend its navigation into eight counties, excluſive of other conveyances by land carriage and canals. It imports annually about 100,000 chaldrons of coals, and above 2000 pipes of wine; in which two articles it exceeds all other ports in England, except London, Briſtol, and Newcaſtle. In return for theſe, and other heavy articles, with which it ſupplies the interior, it receives back for exportation corn and various manufactured articles. Beauties of England and Wales, vol. xi. Richards's Hiſtory, &c. of King's Lynn, 8vo. 1811. Parkin's Hiſtory of Lynn, folio.

LYNX, in *Aſtronomy*, is a conſtellation of the northern hemiſphere, made by Hevelius out of unformed ſtars: the number of ſtars in Hevelius's catalogue is nineteen, and in the Britannic is forty-four. See CONSTELLATION.

LYNX, in *Mythology*, was a fabulous animal conſecrated to Bacchus. See FELIS *Lynx*.

LYNX, in *Zoology*. See FELIS *Lynx*.

LYNX, *Perſian*. See FELIS *Caracal*.

LYOE, in *Geography*, a ſmall iſland of Denmark, near the S. coaſt of Funen. N. lat. 55 3′. E. long. 10° 10′.

LYOENA, a town of Africa, in the kingdom of Algiers, where the independent Arabs lodge their riches as in a place of ſafety; as it is defended by a warlike tribe, who have withſtood the power of the Turks; 106 miles S. of Conſtantina.

LYON, a river of Scotland, which riſes in Loch Lyon, on the S.W. part of the county of Perth, and runs into the Tay; 2 miles E.N.E. of Kenmore.

LYONNET, PETER, in *Biography*, an eminent naturaliſt, was born at Maeſtricht in 1707. He acquired a good knowledge of modern and ancient languages, underſtood muſic, and was a good engraver and ſculptor. He had been originally bred to the law, and became ſecretary to the ſtates of Holland. In the latter years of his life he applied the whole force of his mind to the ſtudy of natural hiſtory, particularly to the ſcience of entomology, on which he wrote ſeveral books. He died at the Hague in 1789: he had been elected a member of the Royal Society of London, and of ſeveral foreign academies.

LYONNOIS, in *Geography*, *Pagus Lugdunenſis*, was, before the revolution, a province of France, bounded on the N. by Bourgogne and Maconnois, on the E. by the Saône and the Rhone, on the S. by Languedoc, and on the W. by Auvergne; lying between 45° 15′ and 46° 15′ N. lat. and between 3° 45′ and 4° 50′ E. long.; being 24 leagues from N. to S. and 16 from W. to E. This province is watered by the Rhone, the Saône, and the Loire, and is moderately fertile, producing grain, wine, and fruits. It was annexed to the crown of France in 1563; and conſiſted of three ſmall provinces, *viz.* Lyonnois Proper, Forez, and Beaujolais. The former, being thirteen leagues in length, and eight in breadth, is diverſified with hills, gentle eminences, and plains. It yields little grain; but ſome diſtricts furniſh good wine, and excellent paſturage. It has a copper mine, and a mineral ſpring. Forez conſiſts principally of an extenſive and fruitful valley, yielding grain, wine, hemp, and cheſnuts, and is watered by the Loire and other ſtreams. Beaujolais is a fertile diſtrict, twelve leagues in length, and ſeven in breadth. Lyonnois and Beaujolais are now included in the department of the Rhone and Forez in that of the Loire.

LYONS, in *Geography*, a ſmall iſland in the Eaſt Indian ſea, near the E. coaſt of Oby. S. lat. 1° 35′. E. long. 128° 14′.

Lyons, *Lugdunum*, a city of France, and capital of the department of the Rhone; but, before the revolution, the capital of the province called Lyonnois, above deſcribed, ſituated at the conflux of the Rhône and the Saône; over the former there are two bridges, and over the latter three. This city was one of the places conquered by Cæſar; but a little after the death of this dictator, Munatius Plancus received orders from the Roman ſenate to re-aſſemble at Lugdunum the inhabitants of Vienne, who had been driven from this city by the Allobroges. In a little time this colony became very powerful, ſo that Strabo ſays it was not inferior to Narbonne, with reſpect to number of inhabitants. In the fifth century this city was taken by the Burgundians, whoſe king became feudatory to Clovis. The ſons of Clovis, however, ſubdued the Burgundians, and took poſſeſſion of Lyons. When the dominions of Lewis Debonnaire were divided, Lyons, with the greateſt part of Burgundy, was transferred to Lothaire. Before the revolution, it was the ſee of an archbiſhop, who was primate of France, and was reckoned the ſecond city of the kingdom in trade, manufactures, and commerce; and was ſuppoſed to contain 150,000 inhabitants. Theſe were, in all periods, diſtinguiſhed for induſtry, arts, and love of freedom. Under the Romans, as a municipium, it poſſeſſed valuable immunities: and when it became a colony, it was cheriſhed and protected. Under the ſovereigns of France, it has enjoyed peculiar privileges, being governed by its own magiſtrates, and guarded by its own militia. Four annual fairs, each of fifteen days, inſtituted in the reign of Lewis XI., have much contributed to the advancement of its traffic. Its good government naturally attracted citizens, whilſt the troubles excited at various periods in the neighbouring ſtates, more eſpecially about the year 1290, between the contending factions of the Guelphs and Ghibellines, occaſioned many from Italy and Florence to take refuge in a city where they could live in ſecurity and peace. The principal dependence of Lyons, and the ſource of its wealth, have been its manufacture of ſilk in all its branches. The trade of Lyons has been immenſe with Spain, Italy, Switzerland, Germany, Holland, England, &c. From Spain, the inhabitants received wool, ſilks, drugs, piaſtres, and ingots of gold and ſilver, in return for cloth, linen, fuſtian, coffee, paper, &c. To Italy they ſent cloth, linen, ſilk ſtuffs, lace, books, mercery, and millinery, receiving in return ſilk, velvet, damaſk, ſatin, taffeties, and rice. To Switzerland they ſent coarſe cloth, hats, ſaffron, wine, oil, ſoap, and mercery, and received from thence cheeſe, linen, and, in time of war, horſes. The great towns of Germany purchaſe from Lyons, beſides the ſame merchandize as the Swiſs, ſtuffs of gold and ſilver. From Holland, Lyons took more merchandize than that which it ſent in return. With the other parts of France it carried on a very conſiderable trade. Lyons reckoned eleven pariſhes, ſix gates, four fauxbourgs, and was divided into thirty-five diſtricts, named "Panonages." The cathedral church was a magnificent Gothic building; the town-houſe is eſteemed one of the moſt beautiful in Europe; and its other public buildings, before the revolution, were four abbies, fifty convents, three public ſchools, a college of phyſic, two general hoſpitals, &c.; and, beſides theſe, an academy of ſciences, inſtituted A. D. 1700, and an academy of fine arts, eſtabliſhed in 1724, both which were united in 1758, a ſociety of agriculture, a veterinary ſchool, a theatre, a public library, ſeventy companies of tradeſmen and artiſts, three forts, an arſenal well ſupplied and carefully arranged, an infirmary, five hundred feet in length, &c. to all which we may add magnificent quays. At an early period of the revolution, an union was formed between the towns of Lyons, Marſeilles and Toulon, under the title of "Federal Republicaniſm," contrary to the ſenſe of the nation, which inclined to favour a republic one and indiviſible. Lyons contained a great number of diſaffected perſons, both Royaliſts and Girondiſts, and was declared to be in a ſtate of rebellion. After a ſiege of two months, during which it is ſuppoſed to have loſt 2000 men, and a great part of the city was reduced to aſhes, Lyons ſurrendered, and many of the rebels who were not able to eſcape were taken and executed. By a decree of the convention, the walls and public buildings of Lyons were ordered to be deſtroyed, and the name of the city itſelf to be changed into that of "Ville Affranchie;" but this decree was afterwards repealed. It is ſtated to contain 109,500 inhabitants, and the ſix cantons, into which it is divided, to include 123,510, on a territory of 55 kiliometres, in four communes. N. lat. 45° 46′. E. long. 4° 50′.

Lyons, a village of America, in Ontario county, and townſhip of Phelps, in New York, at the junction of Mud and Canandarque creeks; 16 miles N. of Geneva, and about 20 S. of Sodus; ſituated in a fine country, and accommodated with excellent advantages for water-conveyance.

LYONSIA, in *Botany*, ſerves to commemorate Mr. Iſrael Lyons, born at Cambridge in 1739, being the ſon of a Poliſh Jew, ſettled there as a ſilverſmith; who publiſhed "A Hebrew Grammar," and "Obſervations and Enquiries relating to various Parts of Scripture Hiſtory." He was diſtinguiſhed as a mathematician and botaniſt, and had the honour of inſtructing in the latter ſcience the celebrated ſir Joſeph Banks, by whoſe recommendation he read a courſe of lectures on Botany at Oxford, where ſuch a courſe was then much wanted. He died in London of the meaſles, about two years after he had accompanied Captain Phipps, afterwards lord Mulgrave, towards the north pole, in 1773. For ſome time he was employed as one of the calculators of the Nautical Almanac, for which he received an annual ſalary of an hundred pounds: and at the time of his death he was preparing for the preſs a complete edition of all the works of Dr. Halley. Beſides ſeveral mathematical works, among which we may reckon his "Fluxions," publiſhed in 1758; he had in contemplation a *Flora Cantabrigenſis;* but publiſhed only a "*Faſciculus*" of plants diſcovered in that neighbourhood ſince the time of Ray, in 1763, in 8vo. Brown. Prodr. Nov. Holl. v. 1. 466. Wern. Tranſ. v. 1. 66.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Contortæ*, Linn. *Apocineæ*, Juſſ. Brown.

Eſſ. Ch. Corolla funnel-ſhaped; its mouth and tube without ſcales; limb in five deep, recurved, equilateral ſegments. Stamens prominent; filaments thread-ſhaped, inſerted into the middle of the tube; anthers arrow-ſhaped, cohering with the ſtigma by the middle, their hind lobes void of pollen. Germen of two cells; ſtyle one, thread-ſhaped, dilated at the top; ſtigma ſomewhat conical. Scales at the baſe of the germen combined. Capſule cylindrical, of two cells, its valves like follicles, with a parallel diſtinct partition, bearing the ſeeds on each ſide upon fixed receptacles.

1. L. *ſtraminea*, the only ſpecies, gathered by Mr. Brown

at Port Jackſon, and in Van Diemen's land. A climbing *ſhrub*, with oppoſite *leaves*. *Cymes* terminal, three forked. *Flowers* among the ſmalleſt of this tribe, their limbs bearded.

LYPERANTHUS, from λυπη, *ſadneſs*, and ανθος, a *flower*, becauſe of the very dark-red gloomy hue of the bloſſoms, which is unuſual in this tribe.—Brown Prodr. Nov. Holl. v. 1. 325.—Claſs and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Gen. Ch. *Cal.* Perianth ſuperior, ringent, of three leaves, the upper one vaulted, the reſt flattiſh. *Cor.* Petals two, nearly equal and ſimilar to the flatter calyx-leaves. Nectary ſhorter, its edges aſcending, hood-like, with a taper point, the diſk glandular or papillary. *Stam.* Anther terminal, permanent, its cells cloſe together; maſſes of pollen two in each cell, powdery. *Piſt.* Germen inferior; ſtyle columnar, linear. *Peric.* Capſule. *Seeds* numerous.

Eſſ. Ch. Calyx ringent; its upper leaf vaulted. Lip ſhorter, hooded, glandular, with a taper point. Style linear. Anther vertical, permanent.

A genus of ſmooth *Orchideæ*, growing on the ground. Bulbs naked, undivided, terminating the deſcending caudex, which throws out roots above them. Stem bearing a ſingle leaf cloſe to the root, and two bracteas above, beſides what accompany each flower. Flowers racemoſe, very dark red, moſtly reverſed.

1. L. *ſuaveolens*. Leaf linear, elongated. Petals aſcending. Diſk of the nectary bearing rows of ſeſſile glands; its margin naked.—Found near Port Jackſon, New South Wales.

2. L. *ellipticus*. Leaf lanceolate-elliptical. Diſk of the nectary papillary; its margin naked.—Gathered by Mr. G. Caley in the ſame neighbourhood.

3. L. *nigricans*. Leaf ovate, ſomewhat heart-ſhaped. Petals divided. Lip fringed; its diſk papillary.—Found by Mr. Brown near Port Jackſon, as well as in the ſouthern part of New Holland.

LYRA, in *Anatomy*, a name applied to a certain part of the brain. See Brain.

Lyra, in *Aſtronomy*, a conſtellation in the northern hemiſphere.

The number of its ſtars, in Ptolemy's catalogue, is ten; in Tycho's, eleven; in Hevelius's, ſeventeen; and in the Britannic catalogue, twenty-one. See Constellation.

Lyra, Nicholas de, in *Biography*, a learned French monk and commentator on the ſcriptures in the thirteenth and fourteenth centuries, was born in a ſmall town in the dioceſe of Evreux, in Normandy. He was deſcended from Jewiſh parents, but becoming a Chriſtian, he embraced a religious life in a monaſtery at Verneuil, in 1291. Having remained there ſome time, he was ſent to Paris, where he applied with the greateſt diligence to his ſtudies, and was admitted to the degree of doctor. He died in this city in the year 1340. He was author of "Poſtills," or a compendium of the whole bible, which he began in 1293, and finiſhed in the year 1330. The firſt edition of this work was publiſhed at Rome in 1472, in ſeven volumes folio, and is now become rare; but it has ſince undergone various impreſſions at Baſil, Lyons, Doway, Antwerp, &c. of which the beſt is ſaid to be that of Antwerp in 1634, in ſix volumes folio. De Lyra was alſo the author of "Moral Commentaries upon the Scriptures;" "A Diſputation againſt the Jews;" and other pieces. Moreri.

Lyra, in *Ichthyology*, the name of a fiſh of the *trigla* kind, of which there are two varieties, reckoned by Artedi and Linnæus two different ſpecies. The one is the *piper* (ſee Trigla *Lyra*), the other, the *lyra cornuta*, or horned harp-fiſh. This laſt is a fiſh of an octangular form, covered all over with bony ſcales; theſe are of a rhomboidal figure, and each has in its middle a ſharp and ſtrong prickle bending backwards: it is of a red colour, and its head is very large; its ſnout divides towards the extremity into two long horns, on which are placed two perpendicular ſpines, and a third above makes an acute angle with theſe; it has one very long fin on the back, and another anſwering to it behind the anus: alſo two large ones at the gills, and two ſmaller on the belly; it has only two filaments, called fingers, behind its gill-fins; its mouth is large, but has no teeth, and there are ſeveral beards on its under jaw; two of which are longer than the reſt, and are branched: it is caught in the Mediterranean, and brought to market at Rome; it is a ſcarce fiſh in other places, and at Montpellier was once ſhewn to Mr. Ray for the remora. See Trigla *Cataphracta*.

Lyra is alſo a ſpecies of *Callionymus*; which ſee. See Dragonet, under which article the other ſpecies of the callionymus are deſcribed.

Lyra is alſo the name of a beautiful ſea-ſhell of the genus of the concha globoſa, or dolium. There are three ſpecies of the lyra, or harp-ſhell. 1. The common lyra, which has thirteen roſe-coloured ribs running along its body. 2. The eleven-ribbed lyra; and 3. The noble harp, or *lyra nobilis*. This is a moſt elegantly variegated ſhell; its ground colour is a deep brown, and its variegations very elegant and black. See Conchology.

Lyræ *Lucida*. See Lucida.

LYRATUM Folium, in *Botany*. See Leaf.

LYRE, Λυρα, *Lyra*, in the *Ancient Muſic*, a muſical inſtrument of the ſtring kind, ſo dear to the Greeks, that they have by turns attributed its invention to Mercury, Apollo, Linus, Orpheus, and Amphion; making it the ſymbol of all excellence in poetry and muſic. The poets and hiſtorians of fabulous times, however, ſeem moſt to agree in aſcribing the invention to Mercury. And among the accounts of the ſeveral writers of antiquity who have mentioned this circumſtance, and confined the invention to the Egyptian Mercury, that of Apollodorus (Bibliotheca, lib. ii.) ſeems the moſt intelligible and probable. "The Nile," ſays this writer, "after having overflowed the whole country of Egypt, when it returned within its natural bounds, left on the ſhore a great number of dead animals of various kinds, and, among the reſt, a tortoiſe, the fleſh of which being dried and waſted by the ſun, nothing was left within the ſhell but nerves and cartilages, and theſe being braced and contracted by deſiccation, were rendered ſonorous; Mercury, in walking along the banks of the Nile, happening to ſtrike his foot againſt the ſhell of this tortoiſe, was ſo pleaſed with the ſound it produced, that it ſuggeſted to him the firſt idea of a lyre, which he afterwards conſtructed in the form of a tortoiſe, and ſtrung it with the dried ſinews of dead animals."

Cenſorinus, however (De Die Nat. cap. 22.), attributes to Apollo the firſt idea of producing ſound from a ſtring, which was ſuggeſted to him by the twang of his ſiſter Diana's bow. Ψαλλειν is ſtrictly to twang a ſtring, and Ψαλμος the ſound which the bow-ſtring produces at the emiſſion of the arrow. Euripides in Bacch. v. 782. uſes it in that ſenſe,

"——————— τοξων χερι
Ψαλλουσι νευρας."

"Who twang the nerve of each elaſtic bow."

Father Montfaucon ſays it is very difficult to determine in what the lyre, cithara, chelys, pſaltery, and harp differed from each other; as he had examined the repreſentations of ſix hundred lyres and citharas in ancient ſculpture, all which be found without a neck, and the ſtrings open as in the modern harp, played by the fingers. (Antiq. Expl. tom. iii. lib. 5. cap. 3.) But though ancient and modern authors uſually confound theſe inſtruments, yet a manifeſt diſtinction is made by Ariſt. Quintil. in the following paſſage, p. 101. After diſcuſſing the characters of wind-inſtruments, he ſays, "Among the ſtringed inſtruments, you will find the lyre of a character analogous to *maſculine,* from the great depth or gravity, and roughneſs of its tones; the ſambuca of a *feminine* character, *weak* and *delicate,* and from its great *acuteneſs,* and the ſmallneſs of its ſtrings, tending to *diſſolve* and *enervate.* Of the intermediate inſtruments, the polypthongum *partakes* moſt of the *feminine;* but the cithara *differs not much* from the *maſculine character* of the lyre." Here is a ſcale of ſtringed inſtruments; the lyre and ſambuca at the extremes; the polypthongum and cithara between; the one next to the ſambuca, the other next to the lyre. He afterwards juſt mentions that there were others between theſe. Now it is natural to infer, that as he conſtantly attributes the manly character to gravity of tone, the cithara was probably the more acute inſtrument of the two; leſs loud and *rough,* and ſtrung with ſmaller ſtrings. Concerning what difference there might be in the form and ſtructure of the inſtruments, he is wholly ſilent. The paſſage, however, is curious as far as it goes, and deciſive. The cithara may, perhaps, have been as different from the lyre, as a ſingle harp from one that is double; and it ſeems to be clearly pointed out by this multiplicity of names that the Greeks had *two* principal ſpecies of ſtringed inſtruments; one, like our harp, of full compaſs, that reſted on its baſe; the other more portable, and ſlung over the ſhoulder, like our ſmaller harp or guitar, or like the ancient lyres repreſented in ſculpture.

Tacitus, Annal. xvi. 4. among the rules of decorum obſerved by public performers, to which Nero, he ſays, ſtrictly ſubmitted, mentions, "That he was not to ſit down when tired." Ne feſſus reſideret. It is remarkable that he calls theſe rules, *Citharæ Leges,* "The Laws of the Cithara;" which ſeems to afford a pretty fair proof of its being of ſuch a ſize and form as to admit of being played on *ſtanding.*

The uſe of the phorminx in Homer, leads rather to the rough, manly, harp-like character. But a paſſage in Orpheus, Argon. 380, ſeems to make phorminx the ſame as chelys, the lutiform inſtrument of Mercury. It is there ſaid of Chiron, that he "ſometimes ſtrikes the cithara of Apollo; ſometimes the ſhell-reſounding phorminx of Mercury,

> "Αλλοτε δ’ αυ Φοιβῳ κιθαρην μετα χερσιν αρασσων,
> Ηλιγυρην φορμιγγα χελυκλονον Ερμαωνος."

This paſſage is curious; for though the Argonautics were not written by Orpheus himſelf, they have all the appearance of great antiquity.

The belly of a theorbo, or arch-lute, is uſually made in the ſhell-form, as if the idea of its origin had never been loſt; and the etymology of the word guitar ſeems naturally deducible from cithara; it is ſuppoſed that the Roman C was hard, like the modern K, and the Italian word *chitarra* is manifeſtly derived from Κιθαρα, *cithara.*

In the hymn to Mercury, aſcribed to Homer, Mercury and Apollo are ſaid to play with the cithara *under their arms,* ver. 507. ὁ δ’ ὑπωλενιον κιθαριζεν, *ſub ulna citharâ-ludebat,* "played with the cithara *under his arm.*" So in ver. 432. ἐπωλενιον, *at* his arm, ſhould, according to the critics, be ὑπωλενιον, as it is afterwards. This ſeems to point out a guitar more than a harp; but the ancients had lyres, citharas, and teſtudos of as different ſhapes from each other, as our harp, ſpinnet, virginal, and pianoforte.

Theſe paſſages in old authors are a kind of antique drawings, far more ſatisfactory than thoſe of ancient ſculpture; for we have ſeen the ſyrinx, which had a regular ſeries of notes aſcending or deſcending, repreſented with ſeven pipes, four of one length, and three of another, which of courſe would furniſh no more than two different ſounds. The cymbals too, which were to be ſtruck againſt each other, are placed in the hands of ſome antique figures in ſuch a manner, that it is impoſſible to bring them in contact with the neceſſary degree of force, without amputating, or at leaſt violently bruiſing the thumbs of the performer. And it is certain that artiſts continued to figure inſtruments in the moſt ſimple and convenient form for their deſigns, long after they had been enlarged, improved, and rendered more complicated. An inſtance of this in our own country will confirm the aſſertion. In the reign of George II. a marble ſtatue was erected to Handel, in Vauxhall gardens. The muſician is repreſented playing upon a lyre. Now if this ſtatue ſhould be preſerved from the ravages of time and accident 12 or 1400 years, the antiquaries will naturally conclude that the inſtrument upon which Handel acquired his reputation was the lyre; though we are at preſent certain that he never played on, or even ſaw a lyre, except in wood or ſtone.

In one of the ancient paintings at Portici, we ſaw a lyre with a pipe or flute for the croſs bar, or bridge at the top. Whether this tube was uſed as a flute to accompany the lyre, or only a pitch-pipe, we know not; nor in the courſe of our enquiries has any ſimilar example of ſuch a junction occurred elſewhere.

Broſſard ſeems to have abridged the hiſtory and progreſs of the lyre chronologically in the moſt ſhort and clear manner, which Graſſineau has ſpun out to great length by jumping from one century to another, and crowding together all the wild and incoherent ſtories relative to the lyre, its inventors and performers, that he could find. All that the diligent and generally accurate Broſſard ſays on the ſubject is, that the lyre was a ſtringed inſtrument, upon which the whole muſical ſyſtem of the ancients has been built. It is pretended that Mercury firſt invented it by chance, and that it had only then three ſtrings, which conſiſted of B C D; that Apollo added a fourth, Corebus, a fifth, Hyagnis, a ſixth, and Terpander, a ſeventh. It remained in this ſtate till the time of Pythagoras, or, according to others, Lycaon added to it an eighth ſtring, to render the extremities *conſonant.* Timotheus afterwards added a ninth, tenth, and eleventh ſtring. Others after him increaſed the number to ſixteen, that is, fifteen principals, and one added, which will be explained in the articles PROSLAMBANOMINOS and SYSTEM; which ſee.

Mr. Barnes, in the prolegomena to his edition of Anacreon, has an inquiry into the antiquity and ſtructure of the lyre; of which he makes Jubal the firſt inventor. For the ſeveral changes this inſtrument underwent, by the addition of new ſtrings, he obſerves, that, according to Diodorus, it had originally only three, referring to the three ſeaſons of the year, as the Greeks counted them, *viz.* ſpring, ſummer, and autumn; whence it was called τριχορδος. Afterwards it had ſeven ſtrings; as appears from Homer, Pindar, Horace, Virgil, &c. Feſtus Avienus gives the lyre of Orpheus nine ſtrings. David mentions an inſtrument of that ſort ſtrung with ten, *in pſalterio decachordo.* Timotheus of Miletus added four to the old ſeven, which made eleven. Joſephus, in his Jewiſh Antiquities, makes mention of one with twelve ſtrings; to which were afterwards added ſix others, which made eighteen in all. Anacreon himſelf ſays, p. 253, of Mr. Barnes's edition, *canto viginti totis chordis*. As for the modern lyre, or Welſh harp, it is ſufficiently known. (See Harp.) From the lyre, which all agree to be the firſt inſtrument of the ſtringed kind in Greece, there aroſe an infinite number of others, different in ſhape and number of ſtrings; as the pſalterium, trigon, ſambucus, pectis, magadis, barbiton, teſtudo (the two laſt uſed promiſcuouſly, by Horace, with the lyre and cithara), epigonium, ſimmicium, and pandura; which were all ſtruck with the hand, or a plectrum. See Psaltery, Sambuca, Magadis, Barbiton, and Cithara.

Lyre, *Lydian*. See Lydian *Lyre*.

Lyre *of the Muſcovites*. This is a rude and coarſe inſtrument, in the form of the ancient lyre of ſix ſtrings, as thick as packthread, which are thrummed with the naked fingers after the manner of the lute.

Lyre, among painters, ſtatuaries, &c. is an attribute of Apollo and the Muſes.

LYRIC, ſomething ſung or played on the lyre or harp.

Lyric is more particularly applied to the ancient odes and ſtanzas; which anſwer to our airs or ſongs, and may be played on inſtruments. See the next article.

Lyric *Poetry*, verſes written for muſic; which, with the ancients, implied verſes to be ſung to the accompaniment of the lyre. In the ſupplement to the firſt edition of the folio Encyclopédie, there is a very long article on the ſubject. We have often admired the ingenuity, refinement, and apparent feeling, with which the French treat the ſubject of dramatic muſic. Even in the feuds and diſcuſſions of the Gluckiſts and Picciniſts, many of the tracts and pamphlets ſeem to breathe the pureſt taſte and moſt profound reaſoning of which the theme is capable. The Italians, who have ſo long furniſhed models of perfection to the reſt of Europe in compoſition and performance, have not half ſo much to ſay in defence of their talents as the French in attacking them.

The article Lyric Poetry in the ſupplement to the firſt edition of the Encyclopédie, written long before the firm adherents to Lulli and Rameau were extinct, is of great length, and ſeems to flow from a writer who had read, meditated, and felt, with enthuſiaſm, all the inſpirations of the lyric bards of Greece. He has taken a wide range in treating the ſubject, and conſidered the union of poetry and muſic, not only with more enlarged views than any other modern, but perhaps than the ancients themſelves. He begins in the following manner: "The lyric poetry of the Grecians was not only ſung, but compoſed to the chords of the lyre. This was at firſt the characteriſtic diſtinction of all that was called lyric poetry by the Romans, and their deſcendants and imitators in later times. The poet was a muſician, he called upon the god of verſe, and animated himſelf with a prelude. He fixed upon the time, the movement, and the muſical period; the melody gave birth to the verſe; and thence was derived the unity of rhythm, character, and expreſſion, between the muſic and the poem that was ſung. Thus the poetry became naturally ſubſervient to number and cadence, and thus each lyric poet invented not only the proper kind of verſe, but alſo the ſtrophe analogous to the melody which he himſelf had created, and to which he compoſed it.

"In this reſpect, the lyric poem or ode with the Latins and with modern nations, has been nothing more than a frivolous imitation of the lyric poem of the Greeks: they ſay, *I ſing*, but never do ſing; they ſpeak of the chords of the lyre, but have never ſeen a lyre. No poet, ſince Horace incluſively, appears to have modelled his odes upon a melody. Horace adopting, by turns, the different formulæ of the Greek poets, ſeems ſo much to have forgotten that an ode ought to be ſung, that he has often ſuſpended the ſenſe at the end of the ſtrophe, where the air ought to repoſe, to the beginning of the next ſtanza."

This ſpecies of poetry was originally employed in celebrating the praiſes of gods and heroes; though it was afterwards introduced into feaſts and public diverſions: it is a miſtake to imagine Anacreon, as the Greeks do, the author of it; ſince it appears from ſcripture to have been in uſe above a thouſand years before that poet. Mr. Barnes ſhews how unjuſt it is to exclude heroic ſubjects and actions from this ſort of verſe, lyric poetry being capable of all the elevation and ſublimity ſuch ſubjects require; which he confirms by the examples of Alcæus, Steſichorus, Anacreon, and Horace, and by his own eſſay, a triumphal ode inſcribed to the duke of Marlborough, at the head of this edition: he concludes with the hiſtory of lyric poetry, and of thoſe ancients who excelled in it.

The characteriſtic of lyric poetry, which diſtinguiſhes it from all others, is *dignity* and *ſweetneſs*. As *gravity* rules in heroic verſe; *ſimplicity*, in paſtoral; *tenderneſs* and *ſoftneſs*, in elegy; *ſharpneſs* and *poignancy*, in ſatire; *mirth*, in comedy; the *pathetic*, in tragedy; and the *point*, in epigram; ſo in the lyric, the poet applies himſelf wholly to ſoothe the minds of men, by the ſweetneſs and variety of the verſe, and the delicacy and elevation of the words and thoughts; the agreeableneſs of the numbers, and the deſcription of things moſt pleaſing in their own nature. See Ode and Poetry.

LYRODI, among the *Ancients*, a kind of muſicians who played on the lyre, and ſung at the ſame time.

Lyrodi was alſo an appellation given to ſuch as made it their employment to ſing lyric poems, compoſed by others.

LYS, in *Geography*, one of the 13 departments of the region of France, called the Reunited Country, formed of a part of Auſtrian Flanders; bounded on the N. by the ſea, and on the E. by the department of the Eſcaut, in N. lat. 51°. It contains 3662½ kiliometres, or 159 ſquare leagues, and 470,707 inhabitants. It is divided into four circles or diſtricts, 36 cantons, and 250 communes. Its circles are Bruges, containing 149,421 inhabitants, Furnes, 49,808, Ypres, 107,103, and Courtray, 164,375. The annual contributions amount to 4,915,251 fr. and the annual expences for government, the adminiſtration of juſtice, and public inſtruction, amount annually to 358,916 fr. 66 cents. The capital of this department is Bruges. The ſoil, in general, is fertile, and produces all ſorts of grain, flax, tobacco, and excellent paſtures.

Lys, *St.*, a town of France, in the department of the Upper Garonne, and chief place of a canton, in the diſtrict of Muret; 7 miles W. of Muret. The place contains 1140, and the canton 5249 inhabitants, on a territory of 190 kiliometres, in 11 communes.

LYSANDER, a townſhip of America, in Onondago county, New York, incorporated in 1794, and comprehending the military towns of Hannibal and Cicero. The number of inhabitants is 121. It is diſtant 16 miles S.E. of lake Ontario.

Lysander, in *Biography*, an eminent Spartan commander in the laſt years of the Peloponneſian war, was the ſon of Ariſtoclitus, a deſcendant of the Heraclidæ, but not of the royal line. About the year 406 B.C. Lyſander was made the naval commander of the Lacedæmonians. His firſt meaſure was to draw off Epheſus from the intereſt of Athens, which he accompliſhed, and at the ſame time gained the friendſhip of Cyrus the younger. He gave battle to the Athenian fleet, conſiſting of 120 ſhips, at

Ægos-Potamos, in the Thracian Cherſoneſus, and wholly deſtroyed it except three ſhips, with which the enemy's general fled to Evagoras, king of Cyprus. In this celebrated battle, which happened 405 years before the Chriſtian era, the Athenians loſt 3000 men, and with them their empire and influence among the neighbouring ſtates. Lyſander knew how to take advantage of this victory, and in the following year Athens, worn out by a long war of 27 years, gave itſelf up to the power of the enemy, and ſubmitted, in every reſpect, to the power of Lacedæmon. The government of Athens was totally changed, and 30 tyrants were ſet over it by Lyſander. This ſucceſs, and the honour of having put an end to the Peloponneſian war, rendered the conqueror extremely proud, and ambitious of higher diſtinctions than the conſtitution of his country would allow. He aimed at univerſal power, by eſtabliſhing ariſtocracy in the Grecian cities of Aſia, and he attempted to make the crown of Sparta elective, in order that he might ſeize it for himſelf, but was, in this reſpect, unſucceſsful, and he was accuſed of groſs corruption in endeavouring to accompliſh his purpoſes. The ſudden declaration of war againſt the Thebans ſaved him from the accuſations of his adverſaries, and he was ſent with Pauſanias againſt the enemy. The Spartan troops were defeated, and their general Lyſander killed in the year B.C. 394. His body was recovered by his colleague Pauſanias, and honoured with a magnificent funeral. Lyſander was a brave man, but his ambition merited the ſevereſt cenſure. He was arrogant and vain in his public, as well as in his private conduct, and he received and heard with the greateſt avidity the hymns which his courtiers and flatterers ſung to his honour. But in the midſt of all his pomp, his ambition, and his intrigues, he died extremely poor, and on account of his poverty his daughters were rejected by two opulent citizens of Sparta, to whom they had been betrothed during the life of their father. Plutarch. Cornelius Nepos. Anc. Univer. Hiſt.

LYSANDRIA, Λυσανδρια, in *Antiquity*, a Samian feſtival, celebrated with ſacrifices and games in honour of Lyſander, the Lacedæmonian admiral. It was anciently called *herea*, which name was aboliſhed by a decree of the Samians.

LYSANO, in *Geography*, a town of Pruſſia, in the palatinate of Culm; 15 miles S. of Culm.

LYSE, a town of Norway; 8 miles S.S.W. of Bergen.

LYSEKIL, a ſea-port town of Sweden, in the province of Weſt Gothland; 16 miles W. of Uddevalla.

LYSERUS, Polycarp, in *Biography*, a learned Lutheran divine, was born at Winendeen, in Germany, in 1552. He was educated at the expence of the prince of Wittemburg, and was diſtinguiſhed as well for great induſtry as conſiderable talents. He became diſtinguiſhed as a preacher, and received frequent applications to preach, on particular occaſions, at Vienna, and in other parts of Auſtria. In 1576 he took his degree of doctor of divinity, and in the following year, Auguſtus, elector of Saxony, was induced, by the fame of his pulpit talents, to appoint him a miniſter of the church of Wittemburg. He was ſoon raiſed to the profeſſorſhip of divinity in the univerſity, and attained to other high honours. In the year 1594, he was appointed miniſter of the court of Dreſden, where he ſpent the remainder of his life, occupied not only in literary labours, and in miniſterial duties, but in the education of young princes. He died in 1601, in the forty-ninth year of his age. He was a very voluminous writer, particularly as a commentator on the ſcriptures. He wrote likewiſe ſeveral controverſial treatiſes.

Lyserus, John, a Lutheran divine of the ſame family, diſtinguiſhed for his vaſt zeal as a writer in defence of polygamy. The moſt conſiderable of his publications is entitled "Polygamia Triumphatrix," &c. He ſpent his fortune and his life in endeavours to maintain and propagate his favourite doctrine, and with incredible pains travelled through almoſt every country on the European continent, examining libraries for materials to confirm his ſyſtem. At length, having ſpent all his property, and being reduced to great diſtreſs, he died in the neighbourhood of Paris in 1684. Moreri.

LYSIANTHUS, in *Botany*. (See Lisianthus.) The latter is, no doubt, the original reading in Browne's Jamaica. Lamarck adopts the former, apparently from λυσις, *a diſſolver*, alluding to the deobſtruent or purgative qualities of ſome of the ſpecies deſcribed by Aublet.

LYSIARCHA, an ancient kind of magiſtrate, being the pontiff of Lycia, or ſuperintendant of the ſacred games of that province.

Strabo obſerves, that the lyſiarcha was created in a council conſiſting of the deputies of twenty-three cities; that is, of all the cities in the province; ſome of which cities had three voices, others two, and others but one.

Cardinal Norris ſays, that the lyſiarcha preſided in matters of religion; in effect, the lyſiarcha was nearly the ſame with the *aſiarcha*, and *ſyriarcha*; who, though they were all the heads of the councils, or ſtates of thoſe provinces, yet were they eſtabliſhed principally to take care of the games and feaſts celebrated in honour of the gods, whoſe prieſts they were inaugurated, at the ſame time that they were created *lyſiarcha*, *ſyriarcha*, or *aſiarcha*.

LYSIAS, in *Biography*, an eminent Greek orator, born at Syracuſe about the year 459 B.C. He accompanied his father to Athens while he was very young, and was educated with great care in that city. In proceſs of time he became himſelf a teacher of rhetoric, and compoſed orations for others, but does not appear to have been a pleader. He diſtinguiſhed himſelf by the eloquence and purity of his orations, of which it is ſaid by Plutarch, he wrote no leſs than 425, though the number may with more probability be reduced to 230; and of theſe only 34 remain, which are to be found in the collections of the Greek orators. He died in the 81ſt year of his age, and in the 378th year B.C. Lyſias attained great reputation in his time, which his works afterwards ſupported, and he is mentioned with applauſe by Cicero and Quintilian. Lyſias lived at a ſomewhat earlier period than Iſocrates; and exhibits a model of that manner which the ancients call the "tenuis vel ſubtilis." He has none of the pomp of Iſocrates. He is every where pure and attic in the higheſt degree; ſimple and unaffected; but wants force, and is ſometimes frigid in his compoſitions. In the judicious compariſon which Dionyſius of Halicarnaſſus makes of the merits of Lyſias and Iſocrates, he aſcribes to Lyſias, as the diſtinguiſhing character of his manner, a certain grace or elegance ariſing from ſimplicity: "πεφυκε γαρ ἡ Λυσιου λεξις εχειν το χαριεν· ἡ δ' Ισοκρατους, βουλεται: *i. e.* the ſtyle of Lyſias has gracefulneſs for its nature; that of Iſocrates ſeems to have it." In the art of narration, as diſtinct, probable, and perſuaſive, he holds Lyſias to be ſuperior to all orators; at the ſame time he admits, that his compoſition is more adapted to private litigation than to great ſubjects. He convinces, but he does not elevate nor animate. The magnificence and ſplendour of Iſocrates are more ſuited to great occaſions. He is more agreeable than Lyſias; and in dignity of ſentiment, far excels him. Blair's Lect. vol. ii. The beſt editions of

Lyſias's orations is that by Taylor, London, in 1739, and Cambridge 1740.

Lysia, in *Ancient Geography*, a town of Aſia, in Syria, ſeated on the river Marſyas, W. of the river Orontes, and N.W. of the town of Apamea.—Alſo, a town of Aſia Minor, in Caria, placed by Ptolemy in Phrygia Major.—Alſo, a town of the Peloponneſus, in Arcadia, called alſo *Luſias*.

LYSIMACHIA, in *Botany*, a very ancient generic name, and ſo called, according to Pliny and Ambroſinus, from Lyſimachus, a favourite general of Alexander the Great, who was afterwards king of Thrace. The Engliſh name of this plant, *Looſeſtrife*, is evidently taken from λυσις μαχης, *a diſſolution of ſtrife*, or *a peacemaker*, but how this title could apply to the king on whom it was beſtowed, and who appears to have been of a cruel and ferocious temper, we are at a loſs to imagine, unleſs it were like the ludicrous derivation of *lucus*, a non lucendo. Linn. Gen. 83. Schreb. 109. Willd. Sp. Pl. v. 1. 816. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 227. Ait. Hort. Kew. ed. 2. v. 1. 314. Brown. Prod. Nov. Holl. v. 1. 428. Tournef. t. 59. Juſſ. 95. Lamarck Illuſtr. t. 101. Gærtn. t. 50.—Claſs and order, *Pentandria Monogynia*. Nat. Ord. *Rotaceæ*, Linn. *Lyſimachiæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, five-cleft, acute, erect, permanent. *Cor.* of one petal, wheel-ſhaped; tube none; limb in five, ovate-oblong, deeply cloven ſegments. *Stam.* Filaments five, awl-ſhaped, oppoſite to the ſegments of the corolla, moſtly united at the baſe; anthers acuminated. *Piſt.* Germen ſuperior, roundiſh; ſtyle thread-ſhaped, the length of the ſtamens; ſtigma obtuſe. *Peric.* Capſule globoſe, mucronated, of one cell and ten valves. *Seeds* numerous, angular. *Recept.* globoſe, very large, dotted.

Eſſ. Ch. Corolla wheel-ſhaped. Capſule globoſe, pointed, with ten valves.

Obſ. L. *Linum-ſtellatum* has fruit with only five valves.

Nearly the whole of this genus is pretty well known in our gardens, whilſt ſome of its ſpecies are found to grow ſpontaneouſly in our hedges and fields. It is divided into two ſections, the *firſt* of theſe having many flowers on a ſtalk, the *ſecond* compoſed of ſuch as are ſingle-flowered.—Of the firſt ſection are the following.

L. *vulgaris*. Yellow Looſeſtrife. Linn. Sp. Pl. 209. Engl. Bot. t. 761. Curt. Lond. faſc. 5. t. 19.—Panicled. Cluſters terminal. Leaves ovate-lanceolate, acute.—A native of ſhady, watery places on the banks of rivers, flowering in July.—*Root* perennial, creeping. *Stems* erect, three feet high, leafy, many-flowered. *Leaves* oppoſite, often three or four together, ſpreading, veiny, ſmooth, ſometimes downy. *Cluſters* erect, each partial flower-ſtalk with an awl-ſhaped bractea at its baſe. *Flowers* yellow and handſome.

L. *thyrſiflora*. Tufted Looſeſtrife. Linn. Sp. Pl. 209. Engl. Bot. t. 176.—Flowers in lateral, pedunculated cluſters.—This extremely rare plant, when it does occur, may be found in damp, watery ſituations, in particular parts of Yorkſhire and Scotland. It flowers in July.—*Root* perennial, creeping. *Stems* erect, a foot and half high, perfectly ſimple, round, leafy, ſmooth, now and then woolly. *Leaves* oppoſite, ſeſſile, acute, entire, ſmooth. *Flowers* in axillary, denſe cluſters, ſmall, of a leſs brilliant colour than the laſt. Many parts of the herbage and infloreſcence are prettily ſpotted with red.

Of the remaining ſpecies belonging to this ſection, as they are detailed in Willdenow, none are natives of Britain. They are called L. *decurrens*, *Ephemerum*, *atropurpurea*, *dubia*, and *ſtricta*.

The ſecond ſection compriſes, amongſt others, the following:

L. *nemorum*. Yellow Pimpernel, or Wood Looſeſtrife. Linn. Sp. Pl. 211. Engl. Bot. t. 527. Curt. Lond. faſc. 5. t. 18.—Leaves ovate, acute. Flowers ſolitary. Stem procumbent. Stamens ſmooth.—Found not unfrequently in groves and moiſt ſhady places, flowering from May to September.—*Roots* perennial. *Stems* procumbent, creeping, branched, ſquare, reddiſh, ſhining, leafy. *Leaves* oppoſite, on footſtalks, ovate, entire, ſmooth. *Stalks* axillary, ſolitary, ſingle-flowered, ſlender. *Flowers* delicate, yellow.—This and the following ſpecies may be regarded as two of our moſt ornamental common plants, more eſpecially as their myrtle-like herbage, when intermixed or entangled with ferns or moſs, gives a pleaſing variety to the verdure of rocks, and the banks of rivulets, or ſhady ponds.

L. *Nummularia*. Moneywort, or Herb Twopence. Creeping Looſeſtrife. Linn. Sp. Pl. 211. Engl. Bot. t. 528. Curt. Lond. faſc. 3. t. 14.—Leaves ſomewhat heart-ſhaped. Flowers ſolitary. Stem creeping. Stamens glandular.—A native of the banks of ditches and very moiſt meadows. It flowers copiouſly during the ſummer. *Root* perennial. *Stems* proſtrate, ſquare, compreſſed, generally ſimple. *Leaves* oppoſite, on footſtalks, heart-ſhaped or roundiſh, waved, paliſh green. *Corolla* pale lemon-coloured, and, when magnified, clothed with ſmall glands ſtanding on footſtalks, as are alſo the ſtamens.—The qualities both of this and the preceding are to the beſt of our knowledge perfectly unimportant either for medicinal or agricultural purpoſes.

The remaining ſpecies of *Lyſimachia* are none of them natives. We therefore ſelect two or three of the more intereſting exotic ones.

L. *punctata*. Four-leaved Looſeſtrife. Linn. Sp. Pl. 210. Jacq. Auſtr. t. 366.—Leaves generally four together, almoſt ſeſſile. Stalks verticillate, ſingle-flowered.—Found amongſt reeds in Holland, Auſtria, and other parts of Europe, flowering in July and Auguſt. *Root* perennial, ſomewhat creeping and fibrous. *Stems* two or three feet high, upright, downy, leafy, generally ſimple. *Leaves* ovate-lanceolate, entire, frequently ſpotted with black on the lower ſide. *Flowers* rather ſmall, yellow. The ſegments of the corolla pointed, with tawny dots at their baſe.

L. *quadriflora*. Four-flowered Looſeſtrife. Ait. Hort. Kew. n. 7. Sims in Curt. Mag. t. 660.—Leaves oppoſite, ſeſſile, linear, very long. Stalks four together, terminal, ſingle-flowered.—Sent from North America to Kew garden by Mr. Francis Maſſon in 1798. It flowers like the laſt in July and Auguſt.—*Root* perennial. *Stems* quadrangular, much branched. "*Leaves* oppoſite, linear, quite entire, ſmooth, ſeſſile, longer than the branches. *Branches* axillary to the leaves, ſimilar, terminated with four leaves croſſed, ſerving the office of bracteas; from the axils of each of theſe there riſes a flower-ſtalk, bearing a ſolitary flower, nodding." The ſegments of the corolla are crenate and very ſharply pointed, of a beautiful bright yellow colour; whilſt the whole herbage is of a dark, blackiſh-green. It is a hardy perennial, requiring no particular treatment, even bearing the ſmoke of London without much injury.

L. *ciliata*. Ciliated or Fringed Looſeſtrife. Linn. Sp. Pl. 210. (Lyſimachia canadenſis lutea, folio Jalapæ; Walth. Hort. t. 12.)—Leaf-ſtalks fringed. Flowers drooping.—A native of North America, whence it was introduced by Mr. Philip Miller into this country in 1732. It flowers in July and Auguſt.—*Root* perennial, creeping. *Stems* about two feet high, erect. *Leaves* oblong, ſmooth, acuminate, veined,

veined underneath. *Flowers* axillary, yellow, each on a long, ſlender, naked ſtalk. Linnæus in his *Syſtema Vegetabilium* reckons L. *ciliata* as a variety only of his *quadrifolia*, and in this he is followed by Willdenow, but on the authority of the *Species Plantarum* and *Hortus Kewenſis*, we are inclined to conſider them as diſtinct.

L. *Linum-ſtellatum.* Small Looſeſtrife. Linn. Sp. Pl. 211. (Linum minimum ſtellatum; Magnol. Bot. Monſp. t. 162.) —Calyx longer than the corolla. Stem erect, very much branched.—Not uncommon in France and Italy, where it flowers in the ſpring. *Root* annual, capillary, whitiſh. *Stem* about two or three inches high, very ſlender, much branched. *Leaves* ſeſſile lanceolate, pointed, entire. *Flowers* ſmall, of a pale green colour.

Mr. R. Brown, Prod. Nov. Holl. v. 1. 428, ſuggeſts that this genus ought certainly to be divided. He deſcribes one ſpecies as found near Port Jackſon, L. *maculata*, downy, with ovate leaves, and axillary flowers, whoſe ſtalks are ſhorter than the footſtalks. There is no abſolute certainty of this being diſtinct from L. *japonica* of Thunberg.

LYSIMACHIA, in *Gardening*, comprehends plants of the hardy, herbaceous, biennial, and perennial ſorts, of which the ſpecies moſtly cultivated are, the willow-leaved looſeſtrife (L. ephemerum); the purple flowered looſeſtrife (L. dubia); and the upright looſeſtrife (L. ſtricta.)

Method of Culture.—All theſe plants may be readily increaſed, either by ſowing the ſeeds in the autumnal ſeaſon, as ſoon as they become fully ripe, on a moiſt border which has an eaſtern aſpect; or by parting the roots, and planting them out at the ſame ſeaſon in ſimilar ſituations. The plants ſhould afterwards be kept perfectly clean, and where the firſt mode is uſed, removed into the places where they are to remain during the autumn.

But in the ſecond kind the ſeeds ſhould be ſown upon a hot-bed.

The third ſort is beſt increaſed by planting the bulbs thrown out from the axils of the leaves.

Each of theſe different plants may be employed by way of ornament and variety in the clumps, borders, and other parts of gardens and pleaſure grounds.

LYSIMACHIA, in *Ancient Geography*, a town of Thrace, called in the time of Ptolemy *Xamilium*.

LYSIMACHIA *Worm*, in *Natural Hiſtory*, a name given to an inſect found very frequently feeding on the leaves of the *lyſimachia*, or willow-herb. It has uſually been eſteemed a caterpillar, but is properly one of the fauſſe chenilles, having a rounded head, and twenty-two legs; this creature changes its ſkin ſeveral times, and finally changes its colour with it; it is at firſt of a blueiſh-grey, but on its laſt change in the worm-ſtate it becomes of a yellowiſh-green; when it has lived a week, or thereabout, after this laſt change, it becomes a chryſalis, from which there afterwards comes out a four-winged fly.

LYSIMACHIÆ, in *Botany*, an elegant Natural Order of plants, named from the *Lyſimachia*, which is one of them; ſee that article. This order is the firſt in Juſſieu's eighth claſs. See LABIATÆ and GENTIANÆ.

The *Lyſimachiæ* are thus defined.

Calyx divided. *Corolla* generally regular, its limb divided, moſtly into five lobes. *Stamens* define, moſtly five, rarely either more or fewer, being equal in number to, and placed againſt, the ſegments of the corolla. *Style* ſolitary; ſtyle ſimple, or rarely cloven. *Fruit* of one cell with many ſeeds, often capſular, the receptacle of the ſeeds central, unconnected with the valves. *Stem* herbaceous. *Leaves* either oppoſite or alternate.

Section 1, conſiſting of plants whoſe flowers are borne on a leafy ſtem, contains *Centunculus*, *Anagallis*, *Lyſimachia*, *Hottonia*, *Coris*, *Sheffieldia*, *Limoſella*, *Trientalis*, and *Aretia*.

Section 2, comprehends plants whoſe flower-ſtalks ſpring directly from the root, as well as the leaves, and are generally umbellate, with a many-leaved involucrum; ſometimes however they are ſimple and ſingle-flowered. The genera are *Androſace*, *Primula*, *Cortuſa*, *Soldanella*, *Dodecatheon*, and *Cyclamen*.

Juſſieu ſubjoins a 3d Section, of plants akin to the *Lyſimachiæ*. Theſe are *Globularia*, ſurely miſplaced here; *Conobea* of Aublet; *Tozzia*, which two laſt we ſhould rather have referred to the order of *Pediculares*; *Samolus*, *Utricularia*, *Pinguicula*, and *Menyanthes*.

M. Ventenat has choſen to call this order *Primulaceæ*, and he is followed by Mr. Brown. The latter name is perhaps preferable, and there ſeems to be nothing fixed as yet amongſt the ſtudents of natural orders, as to names or their terminations. The ſcience is new and experimental at preſent, and rigid laws ſhould not prevent improvements. It is far otherwiſe with names of genera and ſpecies, which are the current coin, not the paper currency, of the botanical realm.

LYSIMACHUS, in *Biography*, king of Thrace, one of the captains of Alexander the Great, roſe from a very mean condition to the favour of that prince. At the partition of the empire of Alexander, in the year 323 B.C., Thrace, the Cherſoneſe, and the countries adjacent to the Euxine, were allotted to Lyſimachus. When Antigonus had rendered himſelf formidable to all the other ſharers, Lyſimachus joined in the league againſt him, with Seleucus, Ptolemy, and Caſſander. By a ſubſequent treaty, Thrace was confirmed to him; and in imitation of other captains, he took the title of king. He founded the city of Lyſimachia in 309 B.C., and made it his capital. In conjunction with Seleucus, he gained the great battle of Ipſus. He afterwards ſeized upon Macedonia, having firſt expelled Pyrrhus from the throne; but his cruelty rendered him truly odious, and the murder of his ſon Agathocles ſo offended his ſubjects, that the moſt opulent and powerful revolted from him, and abandoned the kingdom. He purſued them into Aſia, and declared war againſt Seleucus, who had given them a kind reception. He was killed in a bloody battle, in the 281ſt year B.C., and in the 80th of his age. His body was found in the heaps of ſlain by the fidelity of his dog, which had carefully watched near it. With great courage and abilities, he was characterized by a cruel and ferocious diſpoſition, which rendered him unworthy of his high fortune. Juſtin mentions a curious fact concerning him, *viz*, that having offended Alexander, he was, as a puniſhment, thrown into the den of a furious lion; and when the ravenous animal darted upon him, he wrapped his hand in his mantle, and boldly thruſt it into the lion's mouth, and by twiſting his tongue, killed an adverſary ready to devour him. This act of courage in ſelf-defence recommended him to the monarch, who pardoned and took him into his favour. Univer. Hiſt.

LYSINE, in *Ancient Geography*, a town of Aſia, in Pamphylia, between Comana and Cormaſa, according to Ptolemy.

LYSINEMA, in *Botany*, from λυσις, *a ſeparation*, and νημα, *a thread* or *ſtamen*, becauſe the ſtamens are unconnected with the corolla, proceeding from the receptacle, below the germen, by which character alone the genus is diſtinguiſhed from *Epacris*, their habit being exactly the ſame. The tube of the corolla however is generally divided, more or leſs deeply, into five parts in *Lyſinema*. Brown Prodr.

Nov. Holl. v. 1. 552.—Claſs and order, *Pentandria Monogynia.* Nat. Ord. *Epacrideæ*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of many erect, imbricated, coloured, permanent leaves; the inner ones gradually largeſt. *Cor.* of one petal, ſalver-ſhaped; its tube generally ſplitting into five parts; limb in five ſmooth beardleſs ſegments, obliquely twiſted to the right. Nectary of five glands, ſurrounding the baſe of the germen. *Stam.* Filaments five, thread-ſhaped, equal, inſerted into the receptacle; anthers incumbent, oblong, burſting lengthwiſe, riſing juſt above the tube. *Piſt.* Germen ſuperior, roundiſh, with five furrows; ſtyle thread-ſhaped; ſtigma obtuſe. *Peric.* Capſule of five cells and five valves. *Seeds* numerous, minute. *Receptacles* five, attached to the central column.

Eſſ. Ch. Calyx of many imbricated coloured leaves. Corolla ſalver-ſhaped; its limb five-cleft, beardleſs. Stamens inſerted into the receptacle, the length of the tube. Capſule of five cells, with many ſeeds.

1. L. *pentapetalum.* Corolla divided to the bottom; its claws unconnected, longer than the calyx, externally ſmooth.—Found by Mr. Brown in the ſouthern part of New Holland.

2. L. *ciliatum.* Corolla divided to the bottom; its claws cohering at the top, externally ſmooth, the length of the calyx.—Native of the ſame country. We have ſeen neither of theſe.

3. L. *laſianthum.* Corolla divided to the bottom; its claws externally woolly, rather longer than the calyx.—Gathered by Mr. Menzies at King George's Sound, on the ſouth-weſt coaſt of New Holland. The *ſtem* is ſhrubby, as in all the reſt, its branches very ſlender, ſmooth, round, leafy. *Leaves* ſcattered, about a quarter of an inch long, elliptic-oblong, narrow, obtuſe, entire, ſmooth; flat above; convex beneath. *Footſtalks* ſhort, ſmooth. *Flowers* few, in a terminal ſimple ſpike, leaning one way, apparently tawny or bluſh-coloured, each near half an inch long. *Calyx-leaves* blunt, with a membranous edge; the inner ones fringed. *Petals* obtuſe.

4. L. *conſpicuum.* Tube of the corolla five-cleft above, longer than the calyx. Leaves lanceolate-awl-ſhaped, cloſe-preſſed.—Found by Mr. Brown in the ſouth of New Holland.

5. L. *pungens.* (Epacris pungens; Cavan. Ic. v. 4. 26. t. 346.)—Tube of the corolla undivided, the length of the calyx. Leaves ſpreading, ovate, ſharp-pointed.—Native of the country about Port Jackſon, New South Wales, from whence ſpecimens were ſent in 1791 by Dr. White. The *ſtem* is woody, with many ſtraight rigid branches, thickly beſet with ſeſſile, rigid, ſmooth, entire, ribbed, ſpinous, and taper-pointed *leaves;* their baſe ovate or heart-ſhaped, cloſe-preſſed, and partly claſping the ſtem; the reſt ſpreading nearly horizontally, very pungent. *Flowers* white and fragrant, very elegant, in denſe, leafy, terminal ſpikes. Segments of the *corolla* pointed, ſomewhat plaited when dry. *Style* prominent, hairy. We have already ſpoken of this ſhrub as *Epacris pungens.* (See Epacris.) Mr. Brown ſubjoins Dr. Sims's red-flowered plant, Curt. Mag. t. 1199, as a variety, and he adds that this *L. pungens* is an intermediate ſpecies, as it were, between *Lyſinema* and *Epacris.* It agrees with the latter in its corolla, but has the inſertion of the ſtamens proper to the former.

LYSIPPUS, in *Biography*, a celebrated ſculptor and ſtatuary, was born at Sicyon, and flouriſhed in the time of Alexander the Great. He was originally a worker in braſs, and then applied himſelf to painting, till his talents and inclination led him to fix on the profeſſion of a ſculptor. He worked with ſuch extraordinary diligence and facility, that he is ſaid to have left 1500 performances, all of ſuch excellence, that any one of them ſingly might have conferred celebrity on him as an artiſt. He attained to ſo high a reputation, that Alexander forbad any ſculptor but Lyſippus to make his ſtatues. Lyſippus improved the art of ſtatuary by a better imitation of the hair, and by an attentive ſtudy of ſymmetry, in which he conſidered how the human figure appeared to the eye, not what were its exact proportions. The moſt admirable of his works were the ſtatues of Alexander, of which he executed a ſeries, beginning from his childhood: one of a man coming out of a bath, placed by Marcus Agrippa before his public baths; and being removed by Tiberius into his own chamber, the Roman people were ſo clamorous for its reſtitution, that the emperor thought it prudent to comply with their wiſhes. A chariot of the ſun at Rhodes was one of his great works, which was, however, ſurpaſſed by a coloſſus at Tarentum 40 cubits high. His ſtatue of Socrates, and thoſe of the twenty-five horſemen who were drowned in the Granicus, were ſo highly valued, that, in the age of Auguſtus, they were ſold for their weight in gold.

LYSIS, a Pythagorean philoſopher, who flouriſhed in the fifth century before Chriſt, was a native of Tarentum, who, according to Jamblichus, was inſtructed in his philoſophy by Pythagoras himſelf. Being well initiated and excelling in the doctrines of his maſter, he opened a ſchool for the purpoſe of inſtructing others, but would never admit perſons of bad character among his auditors. He even refuſed, on that account, entrance to Cylon, one of the wealthieſt people of the city. Cylon was exaſperated at the neglect, as he thought it, and reſolved on revenge. He cauſed the houſe of Milo, in which Lyſis and forty other Pythagoreans were aſſembled, to be ſet on fire; meaning by the violence of a hired mob to aſſaſſinate thoſe, by bludgeons or miſſile weapons, who ſhould eſcape burning. Excepting Lyſis and Archippus, they were every one burnt or ſtoned to death. The philoſopher now retired, firſt into Achaia, and afterwards to Thebes, where he opened a ſchool, and remained an uſeful inſtructor to the Grecian youth till he died. Among other famous diſciples he could, it has been ſaid, mention Epaminondas; though others ſeem to doubt the fact, and to be deſirous of referring that honour to another perſon of the ſame name. Lyſis is celebrated for having been a moſt exact and punctual performer of his promiſes, even on the moſt trivial occaſions. He compoſed Commentaries on the philoſophy of Pythagoras, which have not come down to our times. Some writers have attributed to him the "Golden Verſes;" while others have given them to Philolaus, or Empedocles. There is ſtill extant, under the name of Lyſis, a letter addreſſed to Hipparchus, in which the latter is reproached for having divulged the ſecrets of the Pythagorean philoſophy. It may be found in the "Opuſcula Mythologica et Philoſophica" of Dr. Thomas Gale.

LYSKO, in *Geography*, a town of Lithuania, in the palatinate of Novogrodek; 52 miles S.W. of Novogrodek.

LYSOBYKI, a town of Poland, in the palatinate of Lublin; 20 miles N.N.W. of Lublin.

LYSSA, Λυσσα, a word uſed by medical authors to expreſs that ſpecies of madneſs which is peculiar to dogs and wolves, but is communicated by their bite to man and other animals. Hence perſons labouring under the diſmal effects of ſuch a bite, are called alſo *lyſſodecti.*

LYSSENDORF, in *Geography*, a town of France, in the department of the Sarre, and chief place of a canton, in the diſtrict of Prum. The place contains 117, and the canton 1962 inhabitants, in 25 communes.

LYSTRA, a ſmall town of America, in Nelſon county, Kentucky, ſituated on a weſt water of Rolling Fork, a ſouth branch of Salt river. N. lat. 37° 25′.

LYSWIK, a town of Sweden, in the province of Warmeland; 34 miles N. of Carlſtadt.

LYTHRUM, in *Botany*, the λυθρον of Dioſcorides, moſt probably received its name from the purple tinge of its flowers: λυθρον ſignifying *clotted*, or *gore blood*, to which ſubſtance this plant is ſimilar in colour. Linn. Gen. 240. Schreb. 323. Willd. Sp. Pl. v. 2. 865. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 509. Ait. Hort. Kew. ed. 2. v. 3. 149. Juſſ. 332. Lamarck Illuſtr. t. 408. Gærtn. t. 62. (Salicaria; Tournef. t. 129.)—The *Cuphea* of Brown, in his hiſtory of Jamaica, united to *Lythrum* by Linnæus, is now by general conſent ſeparated, on account of its irregular flower, and capſule with a ſingle cell.—Claſs and order, *Dodecandria Monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Salicariæ*, Juſſ.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, cylindrical, ſtriated, with twelve teeth, the alternate ones leſs. *Cor.* Petals ſix, oblong, rather obtuſe, ſpreading, inſerted into the baſe of the ſegments of the calyx. *Stam.* Filaments twelve, thread-ſhaped, the length of the calyx; the upper ones ſhorter than the lower; anthers ſimple, ſomewhat aſcending. *Piſt.* Germen ſuperior, oblong; ſtyle awl-ſhaped, the length of the ſtamens, declining; ſtigma orbicular, aſcending. *Peric.* Capſule oblong, pointed, covered by the calyx, of two cells. *Seeds* numerous, ſmall.

Eſſ. Ch. Calyx inferior, with twelve teeth. Petals ſix, inſerted into the calyx. Capſule with two cells and many ſeeds.

Obſ. In ſome ſpecies of *Lythrum*, one-ſixth of the parts of fructification is found to be deficient; in others only ſix ſtamens are to be ſeen.—We deſcribe the following principal ſpecies as a ſufficient illuſtration of the genus.

L. *Salicaria*. Purple Lythrum. Linn. Sp. Pl. 640. Engl. Bot. t. 1061. Curt. Lond. faſc. 3. t. 28.—Leaves oppoſite, lanceolate, heart-ſhaped at the baſe. Flowers ſpiked. Stamens twelve. A native of marſhes and the banks of rivers, flowering in July and Auguſt.—*Root* perennial, woody, throwing up many ſtems. *Stems* three feet high, erect, wand-like, quadrangular (occaſionally hexangular) leafy. *Leaves* oppoſite, ſometimes, though rarely, three or four together, ſtill more rarely alternate, ſeſſile, ſmooth above, downy at the margin and underneath. *Flowers* in a whorled ſpike, purple.—One of our moſt ſhowy wild plants, and extremely ornamental to the banks of ditches, ponds, and rivers, though occaſionally to be met with in drier ſituations.

L. *virgatum*. Fine-branched Lythrum. Linn. Sp. Pl. 642. Jacq. Auſtr. t. 7. Curt. Mag. t. 1003.—Leaves oppoſite, lanceolate. Panicle ſtraight. Flowers three together.—Originally found by Cluſius in Auſtria, and in the iſles of the Danube. It was introduced by Jacquin into the gardens at Kew in 1776, where it flowers from June to September.—*Root* perennial, thick. *Stems* upright; at the bottom, round, pale-brown mixed with green, generally leafleſs; towards the top ſquare, leafy and branched. *Leaves* oppoſite, thickiſh, nearly ſeſſile. *Flowers* ſix in a whorl, the lower ones more remote, all axillary, of a deep purple colour.—Linnæus notices a variety of *L. virgatum* which has fewer flowers in the whorl, and whoſe leaves are alternate.

L. *hyſſopifolium*. Hyſſop-leaved Lythrum, or Graſs-poly. Sm. Fl. Brit. 510. Engl. Bot. t. 292. (L. Hyſſopifolia; Linn. Sp. Pl. 642. Jacq. Auſtr. t. 133.)—Leaves alternate, linear-lanceolate. Stamens ſix.—A rare Engliſh plant, to be met with occaſionally in moiſt places where water has ſtagnated through the winter. Common in many other parts of Europe, flowering in Auguſt.—*Root* annual, ſimple, attenuated. *Stem* a ſpan high, branched at the baſe, erect. *Leaves* ſmooth, varying in breadth; the lower ones only, oppoſite. *Flowers* axillary, almoſt ſeſſile, ſolitary, ſmall, purple, hexandrous, though occaſionally five-cleft and pentandrous.

LYTHRUM, in *Gardening*, contains a plant of the hardy, herbaceous, perennial kind, of which the ſpecies cultivated is the common or purple willow-herb (L. Salicaria.)

Method of Culture.—This ſort and varieties may be readily increaſed by parting the roots in autumn, and planting them out in the ſituations where they are to remain. They may likewiſe be raiſed from ſeed ſown at the ſame time, but the firſt is the readieſt method. They delight in rather moiſt ſoil.

All of them are highly ornamental in the larger borders, clumps, and other parts of pleaſure-grounds, being placed towards the back parts, from their full growth.

LYTTA, or LYTTA *Veſicatoria*, in the *Materia Medica*, the name given to the Bliſtering Fly.

The *Ceratum Lyttæ*, or *Ceratum Cantharidis* of P. L. 1787, is compoſed of ſpermaceti cerate, and bliſtering flies, in a very fine powder, in the proportion of ſix drachms of the former to a drachm of the latter, and is prepared by ſoftening the cerate by heat, adding the flies, and mixing them together.

LYTTÆ, *Emplaſtrum*. See EMPLASTRUM.

LYTTÆ, *Tinctura*, *Tinctura Cantharidis*, P. L. 1787, tincture of bliſtering fly, is prepared by macerating for 14 days three drachms of bliſtering flies bruiſed, in two pints of proof ſpirit. In order that this preparation may be certain in its effects, it is neceſſary that the inſects ſhould be freſh and perfect: for want of attention to this circumſtance, large doſes have been given without any ſenſible effect. See BLISTER and CANTHARIDES.

LYTTA, in *Natural Hiſtory*, a genus of inſects, of which there are thirty-two ſpecies enumerated in Gmelin's edition of the Syſt. Nat. The generic character is antennæ filiform; four unequal feelers, the hind ones clavate; thorax roundiſh; head inflected gibbous; ſhells ſoft, flexile, as long as the abdomen. All the ſpecies of this genus are exotics, and ſcattered through the globe, as will be ſeen in the following enumeration: many of them reduced to powder are capable of veſiccating the ſkin on application to the ſurface of the body.

Species.

VESICATORIA; Bliſter-fly. Green; antennæ black. This is the common Cantharis veſicatoria, or Spaniſh-fly of the ſhops: though the inſect has been uſually ranked under the genus Meloe, and has, indeed, been ſo referred to from the article BLISTER in our own work: it is found to have no claim as belonging to that genus, and we have accordingly reſtored it to its proper place. It inhabits many parts of Europe, on aſh and elder trees. It is uſed for various purpoſes in pharmacy, but chiefly for raiſing bliſters; it multiplies greatly, and has a nauſeous ſmell. The odorous particles are extremely corroſive. The female inſect, after impregnation, depoſits her eggs in the ground, where they remain till they have undergone the various changes that are to bring forth the winged inſects.

SEGETUM. Golden; ſhells green. This is a leſs ſpecies than the Veſicatoria; is found in Barbary among corn. The antennæ are black; head and thorax ſometimes golden, ſometimes green with a gloſs of gold ; body golden ; legs duſky.

Nitidula. Green bronzed ; ſhells teſtaceous ; antennæ black. This ſpecies has been ſometimes deſcribed as belonging to the Engliſh inſects ; but Gmelin deſcribes it as inhabiting the Cape only.

Collaris. Black ; crown, thorax, and legs ferruginous ; the ſhells are of an azure colour. This is a large inſect, and is found in the ſouthern parts of Ruſſia. The antennæ are ferruginous ; edge of the thorax a little black. The male is as ſmall again as the female.

Gigas. Azure ; breaſt ferruginous ; it inhabits Guinea. The ſize of this inſect is about the ſame as that of the L. veſicatoria ; one ſex has the ſhells ſtriate, but in the other they are ſmooth.

Syriaca. Villous, green-blue ; thorax rounded and ferruginous. It inhabits the ſouthern parts of Europe.

Ruficollis. An inhabitant of the Eaſt Indies. Glabrous, green-gold ; thorax rufous, tapering before.

Testacea. Above teſtaceous ; ſhells with a large oblong black ſpot near the tip. It inhabits Tranquebar. The head is teſtaceous ; mouth and antennæ black ; thorax punctured and teſtaceous ; ſhells ſmooth ; body black.

Festiva. Shining braſſy-green ; ſhells teſtaceous with ſpots of braſſy-green. The body is entirely green bronze ; ſpot on the ſhells varying. Inhabits Siberia.

Marginata. Black ; margins of the ſhells pale cinereous ; inhabits the Cape of Good Hope ; above opaque, beneath cinereous.

Vittata. Shells black, with a yellow margin ; an inhabitant of America. By ſome entymologiſts this is deſcribed as the Cantharis vittata. Head yellowiſh ; crown with two black ſpots ; thorax black, with three yellow lines ; abdomen and legs black.

Atrata. Body black, immaculate ; inhabits Barbary, and is the Meloe pennſylvanica of ſome writers. About half the ſize of the Vittata, and entirely of a deep black.

Erythrocephala. Black ; head teſtaceous ; thorax and ſhells with cinereous lines. This ſpecies is found in ſeveral parts of Auſtria ; the head is teſtaceous, with a black line down the middle ; mouth black ; thorax channelled.

Oculata. Black, with a yellow callous dot behind the eyes ; inhabits Guinea. Body entirely black immaculate ; behind the eyes on each ſide is a large raiſed yellow dot. Female apterous, ſhells abbreviated.

Dubia. Black ; crown fulvous ; thorax and ſhells immaculate. Inhabits Siberia ; and is the Meloe algiricus of ſome entomologiſts.

Afra. Black ; thorax rufous ; this ſpecies is found in Africa ; and is the Cantharis afra of Olivier.

Hæmorrhoidalis. Blackiſh blue ; end of the abdomen rufous ; the antennæ are black ; head and thorax villous ; body blueiſh.

Quadrimaculata. Black, glabrous ; breaſt downy ; ſhells yellowiſh-grey, with two black and almoſt ſquare ſpots. A native of the northern parts of Aſia ; is found among flowers ; and it exudes a very pleaſant ſmelling oil from its legs. This is a circumſtance attaching likewiſe to the

Fenestrata, which is glabrous, pale teſtaceous ; thorax depreſſed ; ſhells grey tipt with black, have two ſquariſh hyaline ſpots ; found alſo in the Aſiatic parts of Siberia, chiefly among flowers.

Clematidis. Black, with a ſteel-blue gloſs ; ſhell pale teſtaceous immaculate ; found on the clematis in Siberia.

Uralensis. Black, opaque, glabrous ; this is often confounded with the Atrata above deſcribed, and is not ſufficiently diſtinct from it. An inhabitant of Siberia.

Sibirica. Black, opaque, glabrous ; ſhells edged with white ; head red ; eyes, mouth, and antennæ black. Is found on the lotus in divers parts of Siberia. Middle joints of the antennæ, in the male, compreſſed and armed with a tooth.

Lutea. Black, woolly ; ſhells ventricoſe, ſubcompreſſed, pale yellow with ſix black dots. Inhabits Siberia.

Ocellata. Black, woolly ; legs teſtaceous ; head, thorax, and ſhells yellowiſh, the latter with ſix ocellate black ſpots in the middle. Inhabits the Caſpian ſea, and has been deſcribed particularly by Pallas. Like the "Four-ſpotted" and "Feneſtrata", it exudes an agreeable oil from its legs.

Pectinata. Antennæ pectinate ; body black ; front red. It inhabits Siberia.

Cinnabarina. Black ; thorax above, ſhells, and head on each ſide red. Inhabits Carniola.

Rufa. Black ; head rufous. Inhabits Carniola.

Subvillosa. Yellowiſh ſubvillous ; antennæ tapering. Is found in many parts of France.

Bicolor. Teſtaceous ; ſhells tipt with black. Inhabits France.

Formicaria. Brown ; the fore-part of the elytra, and the thorax, which is elongated, are red. This is found in France and other parts of Europe.

Pubescens. Black ; head and thorax pubeſcent ; ſhells yellow, with a ferruginous ſpot on each ſide behind ; this inſect has been found only in muſeums by modern naturaliſts.

Ferruginea. Ferruginous ; head and thorax rufous ; ſhells brown teſtaceous at the baſe. Inhabits various parts of Europe.

LYTTELTON, George, *Lord*, in *Biography*, was the eldeſt ſon of ſir Thomas Lyttelton, bart. of Hagley, in Worceſterſhire, where he was born in January 1708-9. He was educated at Eton, from which place he was removed to Chriſt-church college, Oxford. He was from an early age diſtinguiſhed for his proficiency in claſſical learning, and ſome of his poems were the fruit of his youthful ſtudies. When he had completed his courſe at Oxford, he ſat out upon a tour to the continent, and his letters to his father during his abſence are replete with remarks diſplaying ſolid judgment and ſound principles, while, at the ſame time, they afford a moſt pleaſing example of filial affection and duty, joined with the unreſerved confidence of intimate friendſhip. During his reſidence abroad, he wrote a poetical epiſtle to Dr. Ayſcough, which is thought to be one of the beſt of his works, and another to Pope, elegantly complimentary of that great poet. Upon his return from the continent, he was choſen repreſentative, in parliament, for the borough of Oakhampton. At this time his father was a ſupporter of the exiſting miniſtry under Walpole. The ſon, animated with that patriotic ardour, which ſcarcely ever fails to inſpire the boſom of virtuous and liberal youth, and which it is almoſt diſcreditable for a young man not to feel, took a contrary part, and diſtinguiſhed himſelf among the oppoſers of adminiſtration. His name is to be found among thoſe of the minority in almoſt every important debate, and he zealouſly concurred in every meaſure adopted by Pulteney, Pitt, and other leaders of that party. In 1735 he publiſhed his "Perſian Letters," of which it appears, by the teſtimony of Dr. Warton, he was rather aſhamed at the cloſe of life. Mr. Lyttelton obtained the notice and friendſhip of Frederic prince of Wales, and was appointed ſecretary to his royal highneſs ; by his inſtigation it is imagined the prince aſſumed the patronage of letters, the beneficial effect of which Mallet, Thomſon, and others experienced. It was probably on this account that Pope gave him the praiſe of pure patriotiſm, rather than from any regard to his political principles:

> "Free as young Lyttelton her cauſe purſue;
> Still true to virtue, and as warm as true."

On the death of Thomſon, who left his affairs in a very embarraſſed condition, Mr. Lyttelton took that poet's ſiſter under his protection. He reviſed the tragedy of Coriolanus, and brought it out at the theatre-royal Covent-garden, with a prologue of his own writing, in which he ſo affectingly lamented the loſs of that bard, that not only Quin, who ſpoke the lines, but the whole audience, ſpontaneouſly burſt into tears. He had married, in 1742, Lucy, daughter of Hugh Forteſcue, eſq. and enjoyed in her ſociety the moſt unalloyed happineſs, which was miſerably interrupted by her death in 1746, leaving him one ſon, Thomas, the late lord, and a daughter, Lucy, who married lord Valentia. On the monument of his beloved lady, he inſcribed the following lines.

> "Made to engage all hearts, and charm all eyes:
> Tho' meek, magnanimous; tho' witty, wiſe;
> Polite, as all her life in courts had been;
> Yet good, as ſhe the world had never ſeen:
> The noble fire of an exalted mind,
> With gentleſt female tenderneſs combin'd.
> Her ſpeech was the melodious voice of love
> Her ſong the warbling of the vernal grove.
> Her eloquence was ſweeter than her ſong,
> Soft as her heart, and as her reaſon ſtrong.
> Her form each beauty of her mind expreſſ'd
> Her mind was virtue by the Graces dreſſ'd."

Beſides theſe lines, her affectionate huſband wrote a monody on her death, which diſplays much natural feeling amidſt the more elaborate ſtrains of a poet's imagination.

On the expulſion of Walpole from the miniſtry, Lyttelton, in 1744, was appointed one of the lords of the treaſury. He was always aſſiduous in his parliamentary attendance, and a vigorous ſupporter of the meaſures in which he partook, but never attained the ſtation of leader. He ſpoke with eaſe and fluency, but was not eloquent in the uſual ſenſe of the word. In early life, he ſeems to have entertained ſtrong doubts of the truth of revelation, probably from the corruptions of it, which he had witneſſed on the continent, but upon ſerious and impartial inquiry he became a firm believer in Chriſtianity, and wrote in its defence, "A Diſſertation on the Converſion of St. Paul," which has ever been regarded as a maſterly performance. This piece was written at the deſire of Gilbert Weſt, eſq. in conſequence of Mr. Lyttelton's aſſerting, that, beſides all proofs of the Chriſtian religion, which might be drawn from the prophecies of the Old Teſtament, from the neceſſary connection it has with the whole ſyſtem of the Jewiſh religion, from the miracles of Chriſt, and from the evidence of his reſurrection by all the other apoſtles, he thought the converſion of St. Paul alone, was of itſelf a demonſtration ſufficient to prove Chriſtianity to be a divine revelation.

In 1749 he married again, but the conduct of his ſecond wife proved ſo little to his ſatisfaction, that a ſeparation by mutual conſent enſued in a very ſhort time. By the death of his father in 1751, he ſucceeded to the title and eſtate. His taſte for rural ornament he diſplayed at Hagley, which he rendered one of the moſt delightful places in the kingdom. He occupied ſeveral poſts under government, but at the diſſolution of the miniſtry in 1759 he went out of office, and was, as a reward for his ſervices, raiſed to the honour of a peerage, under the ſtyle and title of baron Lyttelton, of Frankley, in the county of Worceſter.

From this period he chiefly devoted himſelf to the purſuits of literature, and to an extenſive correſpondence with the pious and learned. In 1760 he publiſhed "Dialogues of the Dead," a work abounding in good ſenſe and ſound morality, and which was well received by the public. In 1767 and 1771 he gave the world his "Hiſtory of Henry II., in three vols. 4to." a valuable work, which had occupied a great portion of the latter part of his life, and on which he probably placed his chief expectations for future fame. He has given an accurate and comprehenſive view of the Engliſh conſtitution, as it exiſted at the early period of our hiſtory with which his book is concerned, and of the changes ſubſequent to the Norman conqueſt. The ſtyle of the hiſtory is good; its ſentiments are judicious and liberal, favourable to the beſt intereſts of mankind. The poems of this nobleman preſerve a place among the ſelect productions of the Britiſh muſe, rather on account of the correctneſs of their verſification, the elegance of their diction, and the delicacy of their ſentiments, than as exhibiting any uncommon poetical powers. As a politician, his ſpeeches on the Scotch and mutiny bills, in 1747; on the naturalization of the Jews in 1753; and on the privilege of parliament in 1763, hold him out to public eſtimation. He died in Auguſt 1773, in the 64th year of his age. His miſcellaneous works were publiſhed after his death in one volume 4to. His lordſhip, among other qualities, had a remarkable facility of ſtriking out an extemporary compliment, which obtained for him a conſiderable ſhare of reputation; an inſtance is recorded, when lord Cobham, in a large company, mentioned his deſign of putting up a buſt of lady Suffolk in his beautiful gardens at Stowe, he turned to his friend Lyttelton and ſaid "George, you muſt furniſh me with a motto for it." I will, ſaid he, and inſtantly produced the couplet;

> "Her wit and beauty for a court were made,
> But truth and goodneſs fit her for a ſhade."

Johnſon's Lives of the Poets.

Lyttelton, Charles, an Engliſh prelate, brother of the above, was educated at Eton in grammar learning, from whence he entered himſelf at Univerſity college, Oxford, and afterwards ſtudied the law in the Temple and was called to the bar. He, however, ſoon quitted the profeſſion, entered into holy orders, and in 1747 was appointed chaplain to the king. The year following he was made dean of Exeter, and in 1762 promoted to the biſhopric of Carliſle. He was ſeveral years preſident of the Society of Antiquaries, and contributed ſeveral articles to their Tranſactions. He died in 1768.

M.

M, A liquid conſonant, and the twelfth letter in the alphabet.

It has one unvaried ſound, and is pronounced by ſtriking the upper lip againſt the lower; in which the pronunciation of this letter agrees with that of *b*; the only difference between the two conſiſting in a little motion made in the noſe in pronouncing M, and not in *b*: whence it happens, that thoſe who have taken cold, for M ordinarily pronounce *b*; the noſe, in that caſe, being diſabled from making the neceſſary motion.

All conſonants are formed with the aid of vowels; in *em* the vowel precedes, in *be* it follows: and M is never mute.

Quintilian obſerves, that the M ſometimes ends Latin words, but never Greek ones; the Greeks always changing it in that caſe into *n*, for the ſake of the better ſound.

M is alſo a numeral letter, and among the ancients was uſed for a thouſand; according to the verſe,

> “ M caput eſt numeri, quem ſcimus mille teneri.”

When a daſh is added at the top of it, as $\overline{\text{M}}$; it ſignifies a thouſand times a thouſand.

M, as an abbreviature, ſtands for Manlius, Marcus, Martius, and Mucius: M.A. ſignifies *magiſter artium*, or maſter of arts; MS. manuſcript, and MSS. manuſcripts.

M, in *Aſtronomical Tables*, and other things of that kind, is uſed for *Meridional*, or ſouthern; and ſometimes for *Meridian*, or mid-day.

M, in *Medicinal Preſcription*, is frequently uſed to ſignify a maniple, or handful: and it is ſometimes alſo put at the end of a recipe, for *miſce*, *mingle*; or for *mixtura*, *a mixture*. Thus, *m. f. julapium*, ſignifies *mix*, and *make a julep*.

M, in *Law*, the brand or ſtigma of a perſon convicted of man-ſlaughter, and admitted to the benefit of his clergy.

It is to be burnt on the brawn of his left thumb.

M, in *Muſic*. This letter in old pſalm-tunes, harmonized, ſtands for *mean*, or middle part, the ſecond treble, and ſometimes the counter-tenor. In Scarlatti's leſſons compoſed in Spain, it implies *mano manca*, or left hand.

MA, in *Hindoo Mythology*, is a name of Parvati, the conſort of Siva, as noticed under thoſe articles.

MAA, in *Geography*, a town of Hindooſtan, in Dowlatabad; five miles N.E. of Beder.

MAAB, a ſettlement of Weſt Greenland. N. lat. 62° 6′. W. long. 48° 30′.

MAACAH, Macaati, or *Beth-Maacha*, in *Ancient Geography*, a little province of Syria, E. and N. of the ſources of Jordan, toward Damaſcus. We learn from Joſhua (xiii. 13.) that the Iſraelites would not deſtroy the Maachathites, but permitted them to dwell in the land; and from Deut. iii. 14. and Joſh. xii. 5, that the lot of the half tribe of Manaſſeh beyond Jordan extended to the country. Hence the ſmall canton, near the head of Jordan, on the E. ſide of it, in the way to Damáſcus, was called Maachonitis, or Machonitis.

MAADEN al Nocra, in *Geography*, a town of Arabia Felix, in the province of Hedjas; 140 miles E. of Hagiaz.

Maaden *Uzzumurud*, the *Mine of Emeralds*, a mountain of Egypt, on the coaſt of the Red ſea; 90 miles S. of Coſſeir.

MAADIE′, denoting *Paſſage*, is the name of a village conſiſting of two or three houſes, upon the E. bank of the Nile, ſo called becauſe they ſtand at the place facing the uſual *paſſage* to the Delta. Dr. Shaw conceived this to be the ſcite of the ancient Heraclea, but Sonnini made diligent examination on this ſpot, and could perceive no veſtiges of buildings of a remote time, but half a league further, he remarked upon the coaſt old walls and ruins, which may be traced a long way into the ſea, and which are probably the remains of Heraclea or Heracleum. Maadié is diſtant about ſix leagues from Alexandria, on a lake of the ſame name, which is the extremity of the Canopic branch of the Nile. The lake communicates with the Mediterranean by a narrow opening, at which the French raiſed a block-houſe, from which they were driven by the Britiſh, under lieut. Brown. Maadié is five miles E. of Aboukir.

MAAGRUNNI, two iſlands on the E. ſide of the gulf of Bothnia. N. lat. 65° 25′. E. long. 24° 56′.

MAALMORIE, a cape of Scotland, on the S.E. part of the iſland of Ila.

MAALUM, a town of Bengal; eight miles E. of Toree.

MAAN, John, in *Biography*, a French eccleſiaſtical hiſtorian, was born at Tours, where he probably received the elements of a learned education, being deſigned for the eccleſiaſtical profeſſion: in due time he was admitted doctor by the faculty of the Sorbonne, and became canon and precentor of the church of Tours. He zealouſly devoted his talents and learning to the ſervice of that religion in which he had been brought up. In 1667 he printed at his own houſe a work entitled “ Sancta et Metropolitana Eccleſia Turonenſis, Sacrorum Pontificum ſuorum ornata virtutibus, et ſanctiſſimis Conciliorum Inſtitutis decorata.” This work is highly eſteemed by the French, who repreſent it as replete with erudition and curious reſearches, and as reflecting high honour on the church of Tours and its author. Moreri.

MAANA, in *Geography*, a town of Africa, in the kingdom of Kajaaga, the reſidence of the king, bordering on a branch of the river Senegal, and within a ſhort diſtance of the ruins of Fort St. Joſeph.

MAANINGA, a town of Sweden, in the government of Kuopio; 20 miles N.N.W. of Kuopio.

MAAR, a ſmall iſland in the Eaſt Indian ſea, near the South coaſt of the iſland of Ceram. S. lat. 3° 30′. E. long. 13° 25′.

MAARABAI, a harbour on the W. coaſt of the iſland of Ulietea, in the South Pacific ocean. S. lat. 16° 53′. W. long. 151° 27′.

MAARRA, a town of Aſiatic Turkey, in the government of Aleppo; the reſidence of an aga; 45 miles S.S E. of Aleppo.

MAAS DIRK, in *Biography*, a painter, born at Haerlem in 1656. He at firſt painted ſtill life, after that he ſtudied with and imitated Berchem, but is beſt known by pictures of battles, proceſſions, and cavalcades of horſes, ſomewhat in the ſtyle of Vander Meulen, though not wrought ſo free as the works of that artiſt.

There were two other painters of this name, Arnold van Maas, a diſciple of Teniers, who died young, and Nicholas Maas, who was born at Dort in 1632, and was educated in the ſchool of Rembrandt. He practiſed portrait painting with conſiderable ſucceſs. He lived to the age of 61, and died in 1693.

MAASEYCK, in *Geography*, a town of France, in the department of the Lower Meuſe, and chief place of a canton, in the diſtrict of Ruremonde. The place contains 2205, and the canton 14,704 inhabitants, on a territory of 257½ kiliometres, in 18 communes.

MAASIN, a town on the W. coaſt of the iſland of Leyta. N. lat. 10° 12′. E. long. 124° 49′.

MAASS, in *Commerce*. See MASS.

MAAT, a ſuperficial meaſure of land in Holland, containing 500 ſquare ruthes, of which 600 are equal to a morgen or acre. A ſingle ſquare ruthe contains 169 ſquare feet, each foot being = 121 ſquare inches = 124½ Engliſh inches.

MAATTAN, in *Geography*, a town of Hindooſtan, in Bahar; 34 miles N.N.E. of Durbunga.

MAATZ, NICHOLAS, in *Biography*, an eminent German organ-builder in the ſixteenth century, celebrated by Prætorias, and in Werckmeiſter's organ-gruning. rediv. In 1543 he erected an organ at Stralſund with 43 ſtops, and afterwards was engaged in the ſervice of the king of Denmark.

MAB. See MOAB.

MABA, in *Botany*, is the vernacular name of this genus amongſt the iſlanders of the South Seas. It was firſt deſcribed by Forſter, and afterwards taken up by Linnæus, Schreber, and other authors. Forſt. Gen. 61. Linn. Suppl. 65. Schreb. 678. Mart. Mill. Dict. v. 3. Juſſ. 418. Lamarck Illuſtr. t. 803.—Claſs and order, *Diœcia Triandria*. Nat. Ord. uncertain.

Gen. Ch. Male, *Cal.* Perianth inferior, cloven half way down into three acute, villoſe ſegments. *Cor.* of one petal, tubular, hairy on the outſide; tube cylindrical, longer than the calyx; limb in three, ovate, thickiſh, erect diviſions. *Stam.* Filaments three, thread-ſhaped, ſhorter than the calyx; anthers erect, ovate. *Piſt.* Rudiment globoſe, nearly ſeſſile in the midſt of the flower.—Female, *Cal.* Perianth inferior, permanent, as in the male. *Cor.* and *Piſt.* unknown. *Peric.* Drupa ſuperior, ovate-oblong, of two cells, each containing two oblong, triangular *ſeeds* or *nuts*, ſomewhat convex at their back, flat on both ſides.

Eſſ. Ch. Male, Calyx three-cleſt. Corolla externally hairy; its limb three-cleft. Female, Calyx as in the male. Drupa ſuperior, of two cells.

1. M. *elliptica*. Forſt. Gen. t. 61. Linn. Syſt. Veg. ed. 14. 881. Suppl. 426.—A native of the Friendly Iſlands, more particularly of Tonga Tabu and Namoka.—This is a *ſhrub* whoſe general herbage is extremely ſmooth, its young ſhoots and early leaves alone being hairy. *Leaves* alternate, on ſhort footſtalks, elliptical, veined, very ſmooth. *Stalks* axillary, ſhort, moſtly three-flowered. *Flowers* ſmall, and curious as Linnæus remarks for having the outſide of the calyx and corolla extremely hairy.

Forſter, in his work on eſculent plants, p. 54, mentions another ſpecies, or variety, of this genus, which he calls *Maba major*; the fruit of which is three times as big as that of *elliptica*, the kernels tough and inſipid. The ſame author ſays that the natives eat the nuts of it, and that they were offered for ſale to our people.

MABANOWKA, in *Geography*, a town of Poland, in Volhynia; 12 miles S. of Berdiczow.

MABBY, a kind of wine made from potatoes. It is ſaid to be uſed in Barbadoes.

MABEA, in *Botany*, is derived from the Caribee name of this plant, *Piriri Mabé*. Aublet firſt deſcribed the genus in his *Plantæ Guianenſes*, and ſays it is called *Bois à Calumet* by the French, becauſe the negroes uſe its ſmaller branches as pipes for ſmoaking. Aubl. Guian. 867. Schreb. 641. Willd. Sp. Pl. v. 4. 404. Mart. Mill. Dict. v. 3. Juſſ. 388. Lamarck Illuſtr. t. 773.—Claſs and order, *Monœcia Polyandria*. Nat. Ord. *Tricoccæ*, Linn. *Euphorbiæ*, Juſſ.

Gen. Ch. Male, *Cal.* Perianth inferior, of one leaf, five-toothed, acute. *Cor.* none. *Stam.* Filaments from nine to twelve, inſerted into the bottom of the calyx; anthers roundiſh.—Female, *Cal.* Perianth of one leaf, erect, five-toothed, acute. *Cor.* none. *Piſt.* Germen ſuperior, oblong, ſomewhat triangular, longer than the calyx; ſtyle long; ſtigmas three, thread-ſhaped, revolute. *Peric.* Capſule encloſed in a thick coat, roundiſh, of three lobes and three cells, each cell two-valved, burſting with elaſticity. *Seeds* ſolitary, roundiſh, reddiſh, variegated with grey ſpots.

Eſſ. Ch. Male, Calyx five-toothed. Corolla none. Stamens from nine to twelve inſerted into the calyx.—Female, Calyx five-toothed. Corolla none. Stigmas three. Capſule three-lobed, of three cells. Seeds ſolitary.

Obſ. Juſſieu remarks that in the deſcription of the female flowers of *Mabea* inſtead of "a ſingle ſtyle," it ſhould rather be "ſtyles three, cloſely united or glued into one."

1. M. *Piriri*. Aubl. Guian. t. 334. f. 1.—Leaves ovate-oblong, attenuated at the baſe, pointed.—Found in Guiana and Cayenne, where it flowered and bore fruit in May.—The *trunk* of this plant riſes to about five feet in height, and puts forth numerous, twiggy *branches* very long, ſpreading and entangling themſelves among the neighbouring trees, covered with an aſh-coloured *bark*. *Leaves* alternate, on ſhort footſtalks, entire, green above, whitiſh beneath. *Stipulas* two, long, narrow, deciduous. *Flowers* copious, in long panicles; the males three on a common ſtalk, with two glands and a bractea at the baſe: female flowers beneath the male, ſolitary. Every part of the plant when wounded abounds with a milky ſecretion.

2. M. *Taquari*. Aubl. Guian. t. 334. f. 2.—Leaves oblong, rounded at each end, pointed, ſomewhat heart-ſhaped at the baſe.—Native of Guiana, flowering with the laſt.—This *ſhrub* differs from the laſt in having the *bark* of its trunk and branches of a reddiſh colour. The *leaves* are larger, leſs elongated, and terminated by a ſhort point, curiouſly veined with red underneath. The *fruit* is alſo larger, but in other reſpects it entirely accords with the preceding.

MABER, in *Geography*, a town of Perſia, in Chuſiſtan; 48 miles S.S.W. of Suſter.

MABERIA, a lake of Africa, in the country of *Jinbala*, which ſee; the ſame with the lake of Dibbie, formed by the river Joliba, which runs to the *eaſt*, but miſtaken by d'Anville and Deliſle for the head of the river Senegal, which runs to the *weſt*.

MABEUSE, or MABEUGE, JOHN DE, in *Biography*, one of the early laborious practitioners in the art of painting after the uſe of oil became known in Flanders. He was born at Maubeuge, in Hainault, in 1499.

He was invited by Henry VIII. to England, and employed by him to paint the portraits of his children. By his neat mode of finiſhing, and the ſmoothneſs and high poliſh of his works, he gained in this country, where the art of painting was then almoſt unknown, a very conſiderable reputation, and in conſequence his paintings are not unfrequent among us.

They are known by their dry, ſtiff, and formal manner; both of action in the figures and in the foldings of their draperies, by a total lack of chiaro-ſcuro, and yet poſſeſſing much ingenious taſte in colour; great care in the faces, which always appear to have been portraits; and an almoſt boundleſs labour in the finiſhing; particularly of all the ornamental parts, ſuch as gems, pearls, &c. &c. which he was fond of beſtowing laviſhly.

He is ſaid to have been immoderately addicted to drinking, though he lived to the age of 63.

MABILLON, JOHN, a very learned French Benedictine monk, was born at Pierre-mont, a village belonging to the dioceſe of Rheims, in the year 1632. He was inſtructed in grammar learning by one of his uncles, who afterwards ſent him to the college of Rheims, where he ſoon diſtinguiſhed himſelf by the vivacity of his genius, and an uncommon application to ſtudy. Hence he was taken into the ſeminary of the cathedral, in which the young perſons deſigned for the ſervice of the dioceſe were educated. He continued here three years, and took the habit in an abbey belonging to the Benedictines of the congregation of St. Maur in 1653, and in the following year he made his profeſſion. The higheſt expectations were formed of him; but an inceſſant and almoſt perpetual head-ache rendered him incapable of application, and he was ſent to different places in the country for the recovery of his health. In the year 1660 he was ordained prieſt at Amiens, and as he ſtill laboured under ſo much indiſpoſition, as to render it unfit for him to apply to his ſtudies, he was accordingly employed in ſuch temporal affairs of the congregation as were more adapted to his enfeebled conſtitution. In 1663, in order to reſtrain him from cloſe ſtudies, he was ſent to St. Dennis, and was employed in the low office of exhibiting to ſtrangers the various treaſures and ancient monuments of the abbey. The duties of this ſervile poſt were ill adapted to his mind, and an accident which occurred ſhortly relieved him from the burden which was become almoſt intolerable. He broke a mirror, which it was pretended belonged to the poet Virgil; this ſo enraged his ſuperiors, that they gladly allowed him to make his retreat. His vacant hours he employed in reading the fathers, and in laying up large ſtores of theological, eccleſiaſtical, and critical learning. In 1764 he went to Paris to aſſiſt d'Achery in compiling his "Spicilegium," and took a large ſhare in the buſineſs. The zeal and talents which he manifeſted in this work cauſed him to be appointed to ſuperintend the publication of a complete edition of the works of St. Bernard, which he executed with much correctneſs, judgment, and learning. This work was publiſhed, in 1667, in two folio volumes, and alſo in nine volumes octavo. Immediately after the publication of this great work, he was employed in completing the lives of the ſaints, for which d'Achery and Chantelou had been collecting and digeſting materials. The firſt volume was publiſhed in 1668, under the title of "Acta Sanctorum Ordinis S. Benedicti, &c.;" this was followed at different periods by eight others, of which the laſt was publiſhed in 1702. The work was regarded by the journaliſts of the day, "not as a ſimple collection of memoirs relating to monaſtic hiſtory, but as a valuable compilation of ancient monuments, which being illuſtrated by learned notes, throw much light on the moſt obſcure part of eccleſiaſtical hiſtory. The prefaces themſelves would ſecure to the author an immortal reputation. The manners and uſages of thoſe dark ages are examined with great care, and an hundred important queſtions are diſcuſſed by an exact and ſolid critique." The prefaces were reckoned ſo valuable, that they were publiſhed ſeparately in 1732, in quarto. In 1674 he publiſhed "De Pane Euchariſtico azimo et fermentato Diſſertatio," intended to prove that the Latin church made uſe of leavened bread in the conſecration of the Euchariſt for many ages, and that the uſe of unleavened bread was not introduced till after Photius's ſchiſm. In the following year he publiſhed "Veterum Analectorum, &c.;" but the work which has done moſt honour to the memory of Mabillon appeared in 1681, entitled "De Re diplomatica Libri ſex, &c." So high was the opinion generally entertained of his extraordinary merit, that the celebrated Colbert was deſirous of beſtowing on him a penſion of two thouſand livres, but his unambitious and diſintereſted ſpirit led him to decline that generous offer. In 1682, Colbert engaged him to take a journey into Burgundy, for the purpoſe of examining ſome ancient titles relating to the royal family; after which he ſent him into Germany, to ſearch into the archives and libraries of the ancient abbies in that country, for ſuch documents as might contribute to illuſtrate the hiſtory of France, and that of the church in general, and of the church of France in particular. The reſults of his enquiries into theſe ſubjects were given in the fourth volume of his "Analecta." In 1685, he publiſhed "De Liturgia Gallicana Libri tres, in quibus veteris miſſæ, quæ ante annos mille apud Gallos in uſu erat, forma rituſque eruntur ex antiquis monumentis, &c." In the ſame year Mabillon was ſent at the king's expence into Italy, with the ſame view as he had been formerly ſent into Germany, and was received at Rome with great reſpect; he had free acceſs granted him to all the archives, and to all the libraries, from which he collected a vaſt number of intereſting and important papers, adapted to the deſign of his journey. On his return to France he carried with him a fine collection of books and rare MSS. which he placed in his majeſty's library; and in 1687 he publiſhed an account of his journey, and of the pieces which he had diſcovered, under the title of "Muſæum Italicum, ſeu Collectio veterum Scriptorum ex Bibliothecis Italicis eruta, &c." in two volumes 4to. In 1688, father Mabillon engaged in a diſpute between the Benedictines of Burgundy, and the canons regular, on the ſubject of the precedence of thoſe orders in the ſtates, and, in 1691, he entered into a controverſy with father Rance, abbot of La Trappe, who maintained, that learning and the ſciences were foreign to the monaſtic profeſſion, and who had prohibited the monks almoſt all ſorts of reading, excepting that of the ſcriptures and certain moral treatiſes. In 1698 he publiſhed a work, which involved him in much controverſy and many ſerious difficulties, entitled "Euſebii Romani ad Theophilum Gallum Epiſtola de Cultu ſanctorum ignotorum." It was received by the ſuperſtitious and intereſted, particularly at Rome, in a moſt unfavourable manner. For ſome time it was attacked only by complaints, murmurs, and criticiſms publiſhed in Germany, France, and Italy; but in 1701 it was brought before the congregation of the *Index*, by whom the author would unqueſtionably have been cenſured, if he had not agreed to reprint it with ſuch alterations, emendations, and omiſſions as ſhould be ſuggeſted to him. In the ſame year Mabillon was choſen honorary member of the Academy of Inſcriptions, and publiſhed the firſt volume of the laſt great work to which he devoted his labours, entitled "Annales Ordinis S. Benedicti in quibus non modo res Monaſticæ, ſed etiam Eccleſiaſticæ Hiſtoricæ non minima pars continetur." The ſecond, third, and fourth volumes ſucceeded, and the fifth was compoſed by Mabillon, but not publiſhed till after his deceaſe. Mabillon died in December 1707, ſoon after he had completed his ſeventy-fifth year. In ſpeaking of his great merit, Dupin ſays, "The voice of the public, and the general eſteem of all the learned, are a much better commendation of him than any thing which we can ſay. His profound learning appears from his works; his modeſty, humility, meekneſs, and piety, are no leſs known to thoſe who have had the leaſt converſation with him. His ſtyle is maſculine, pure, clear, and methodical, without affectation or ſuperfluous ornaments, and ſuitable to the ſubjects of which he has treated." In 1724 the poſthumous works of our author were publiſhed in three volumes 4to. by Thuillier. Moreri. Dupin.

MABLY, BENNET DE, abbè, an eminent political writer, was born at Grenoble in 1709. He was brother of the abbè Condillac, whom he reſembled in acuteneſs and penetration. He devoted himſelf to the ſtudy of literature, and died at Paris in 1785. His principal works are "Obſervations on the Greeks;" "Obſervations on the Romans;" "Parallel of the Romans and French;" "Obſervations on the Hiſtory of France;" "Diſcourſes on Hiſtory." All the writings of this author diſplay deep thinking, ſound moral principles, and a great regard for the good of mankind. He is, however, thought to be too much of a panegyriſt of the ancients, and too fond of applying their political maxims to the very different circumſtances of modern ſtates. The work of his old age, entitled "Sur les Conſtitutions des Etats Unis de l'Amerique," gave offence by ſome ſentiments adverſe to civil liberty and religious toleration.

MABOUJAS, the *Devil-lizard*, in *Zoology*, a ſpecies of American lizard, ſo called from its uglineſs and diſagreeable aſpect. It grows to ſix or ſeven inches long, and to the thickneſs of a thumb, and is found in the trunks of rotten trees, and in marſhy places, where the ſun-beams ſeldom reach; it is all over of a gloſſy black colour, and looks as if ſmeared over with oil.

MABOUL, JAMES, in *Biography*, an eminent French prelate, diſtinguiſhed for his pulpit eloquence, and particularly for his orations delivered in praiſe of deceaſed perſons of merit, was deſcended from a family of high rank. He obtained conſiderable eminence in the church, and was employed by the duke of Orleans, the regent, in a fruitleſs attempt to reconcile the hoſtile parties who were contending about the bull *Unigenitus*. His funeral diſcourſes were publiſhed in one volume 12mo, in 1749: they are ſaid to be diſtinguiſhed by that ſweetneſs of ſtyle, that nobleneſs of ſentiment, that elevation, that unction, and that touching ſimplicity, which are the characteriſtics of a good mind, and of true genius. Moreri.

MABRA, in *Geography*, a town of Algiers, in the gulf of Bona; 10 miles W. of Bona.

MAC, an Iriſh word ſignifying *ſon*; frequently prefixed to ſurnames; as *Mac*donald, for Donald's ſon; *Mac*laurin, for Laurence's ſon, &c.

MACA, in *Geography*, a town of Africa, in Hoval; 20 miles from the mouth of the Senegal.

MACABALAR BAY, a bay on the N.W. coaſt of the iſland of Mindanao.

MACABRA, a town of Africa, in Sennaar; 40 miles S.S.W. of Meroe.

MACACO, in *Zoology*. See LEMUR *Macaco*.

MACADRA, in *Geography*, a town of Arabia, in Yemen; 32 miles S. of Chamir.

MACÆ, in *Ancient Geography*, a people of Africa, E. of the Naſamones and near the ſea. Some have ſuppoſed they are the ſame with thoſe called Syrtites by Ptolemy, becauſe they inhabited towards the Great Syrtis. The Cinyps watered their country, and hence Silius Italicus denominates them Cinyphii Macæ.

MACAENS *de Caminho*, in *Geography*, a town of Portugal, in Eſtremadura; 33 miles S.S.E. of Coimbra.

MACAIRE, ST., a town of France, in the department of the Gironde, and chief place of a canton, in the diſtrict of La Reole. The place contains 1483, and the canton 9980 inhabitants, on a territory of 102½ kiliometres, in 15 communes.

MACALLESTER'S BAY, a bay on the E. coaſt of the iſland of Mull. N. lat. 56° 30′. W. long. 5° 45′.

MACALUNGO, a town of Africa, in Mozambique. S. lat. 17°. E. long. 39°.

MACAM, *Indian apple*, in *Natural Hiſtory*, the name of a common Eaſt Indian fruit: it is of a round ſhape, and about the ſize of our common wild crabs which grow in the hedges: inſtead of the ſeveral ſmall ſeeds, which our crabs and apples contain, this fruit has only one hard kernel; it is of an acid taſte, and of a raw and not very agreeable ſmell; the tree which produces this fruit does not grow to any height: it reſembles the quince tree in its leaves, except that they have a yellowiſh caſt. Mem. Acad. Par. 1699.

MACAN, in *Geography*, a town of Perſia, in Khoraſan; 60 miles W. of Meru-Shahigian.

MACANAO, a ſmall iſland in the Caribbean ſea, near the W. coaſt of Margarita. N. lat. 11°. W. long. 64° 40′.

MACANEA, in *Botany*, is a name adopted by Juſſieu for the *Macahanea* of Aublet deſcribed in the ſupplement of his Plants of Guiana, and figured in t. 371 of that work. Neither of thoſe authors had ſeen any of the parts of fructification except the *berry* and *ſeeds* which are thus deſcribed. *Peric.* Berry large, pear-ſhaped, of one cell, pulpy withinſide; its outſide leathery, ſprinkled with red ſpots. *Seeds* from four to ſix, ovate, leathery, covered with a membrane and lying in a white pulp. Aublet, who found this plant in fruit in June, calls it by the ſpecific name of *guianenſis*, with the following deſcription.—*Shrub* putting forth numerous *branches*, twiſting themſelves about the neighbouring trees. *Leaves* oppoſite, on footſtalks, toothed, ovate, acute, ſmooth. *Fruit* axillary, in cluſters.—From the imperfect ſtate in which *Macanea* is known, we cannot pronounce to what claſs it belongs. Juſſieu ranks it amongſt the Natural Order of *Guttiferæ*, and ſays that it is nearly allied to *Mammea* and *Singana*.

MACANNA, in *Geography*, a kingdom of Africa, S. of Bambouk.

MACAO, a town of Portugal, in Eſtremadura; 12 miles N.E. of Abantes.

MACAO.

MACAO, a ſea-port town of China, in the province of Quang-tong, ſituated at the mouth of the Tigris, in the entrance of the bay of Canton, and built on a peninſula, or rather a ſmall iſland, becauſe it is ſeparated from the land by a river, where the ebbing and flowing of the ſea are ſenſibly felt. This tongue of land is joined to the reſt of the iſland only by a ſmall neck, about 100 yards acroſs. The Portugueſe obtained this port from the emperor Camhy, as a reward for the aſſiſtance they gave to the Chineſe in deſtroying the pirates, who from the iſlands in the vicinity of Canton infeſted the ſeas and ravaged all the coaſts of China. Some writers pretend, that this city had no inhabitants but pirates when the Portugueſe formed an eſtabliſhment in it; and that they were only permitted to build huts covered with ſtraw. However this be, their whole extent of territory, bounded by a wall, is not more than eight miles in circumference. In this ſmall ſpot, the Portugueſe carried on, for a long time, almoſt excluſively, a conſiderable traffic with the Chineſe empire, and with other countries in Aſia, particularly Japan, Tonquin, Cochinchina, and Siam. But by the luxury occaſioned by increaſe of wealth and the injurious oppreſſion of the Chineſe, the enterpriſing ſpirit of the Portugueſe declined, and the inhabitants of Macao became enervated by a tropical climate. Their trade to Japan failed; their other ſpeculations became precarious; and this once proſperous ſettlement is now very much reduced. The houſes at Macao are built after the European manner, but they are low, and make little ſhow. Here are 13 churches and chapels, and 50 prieſts, to miniſter to the devotion of between four and five thouſand laity. Of the two pagan temples at Macao, belonging to the Chineſe, one is curiouſly ſituated among a confuſed heap of immenſe maſſes of granite. This temple is compriſed of three ſeparate buildings one over the other; the only approach to which is by a winding flight of ſteps hewn out of the ſolid rock. The cave of Camoens, ſituated a little above the loftieſt eminence in the town, was conſtructed, probably, in the ſame manner as the temple above deſcribed, by bringing together a vaſt number of rocks. This cave, from a tradition current in the ſettlement, belonged to Camoens, a Portugueſe poet, who reſided a conſiderable time at Macao, and in which cave, it is ſaid, he wrote the celebrated poem of the Luſiad. The whole population of Macao, according to the ſtatement of La Perouſe, may be computed at 20,000, of whom 100 are Portugueſe by birth, 2000 metis, or half Indians and half Portugueſe, with as many Caffre ſlaves, their domeſtics. The reſt are Chineſe, who employ themſelves in commerce and different trades, by which they lay the Portugueſe under contribution to their induſtry. Theſe laſt, though almoſt all Mulattoes, would think themſelves diſgraced, if they ſupported their families by exerciſing any mechanic art, though their pride is not above continually ſoliciting charity, with importunity, from every one that paſſes by them.

The road-ſtead of Macao is ſufficiently ſpacious to contain 60 gun-ſhips at the entrance of Typa; and in its harbour, which is below the town, and communicates with the river up to the eaſtward, ſhips of ſeven or eight hundred tons, with half their lading. The mouth of this harbour is defended by a fortreſs of two batteries, which muſt be kept within piſtol-ſhot in entering. Three ſmall forts, two of which are mounted with twelve guns, and the third with ſix, protect the ſouth ſide of the town from every attempt of the Chineſe. Theſe fortifications, which are in the worſt poſſible ſtate, would be far from formidable to Europeans, but they may eaſily overawe all the maritime forces of the Chineſe. A mountain alſo commands the road, where a detachment of troops could hold out a very long ſiege. The Portugueſe of Macao, more devout than warlike, have built a church on the ruins of a fort, which covered this mountain, forming, at that time, an impregnable poſt. The ſide next the land is defended by two fortreſſes, one of which is mounted with 40 guns, and capable of containing a garriſon of 1000 men. It is provided with a ciſtern, two ſprings of running water, and caſemates for laying up warlike ammunition and proviſions. The other, which mounts 30 guns, cannot receive above 300 men, and has a very abundant ſpring that never fails. Theſe two citadels command the whole country. The Portugueſe frontiers extend nearly a league from the town, and are bounded by a wall guarded by a mandarin and a few ſoldiers. This mandarin is the true governor of Macao, whom all the Chineſe obey, though he is not allowed to ſleep within theſe limits. But he may examine all the fortifications, inſpect the cuſtom-houſes, &c.; and on theſe occaſions the Portugueſe are obliged to give him a ſalute of five guns: but no European can make a ſingle ſtep on the Chineſe territory, beyond the wall, which would ſubject him either to impriſonment or a heavy contribution. The palace of the Chineſe mandarin is in the middle of the city; and the Portugueſe are conſtrained to pay a tribute of 100,000 ducats for the liberty of chooſing their own magiſtrates, exerciſing their religion, and living according to their own laws. The viceroy of Goa nominates to all civil and military offices at Macao, and appoints the governor and all the ſenators, who participate in the civil authority. He has lately fixed the garriſon at 180 Indian ſeapoys, and 120 militia-men, whoſe ſervice conſiſts in patroles at night. The ſoldiers are armed with ſticks, and the officer alone has the privilege of wearing a ſword; though he can on no occaſion employ it againſt a Chineſe. The ſenate of Macao is compoſed of the governor, who is preſident, and three "verendores," who are the auditors of the city finances. The revenue conſiſts of the duty laid on merchandize, which can only be imported in Portugueſe veſſels. If Macao were made a free port, and had a garriſon capable of defending commercial property, when depoſited there, the revenue of their cuſtom-houſe would be doubled, and would be adequate to all the expences of the government. But a trifling intereſt pertaining to the viceroy of Goa, from ſelling Portugueſe commiſſions to merchants of various nations who carry on a coaſting trade in the Eaſt Indies, and preſents from ſhip-owners to the ſenate of Macao, raiſe an inſurmountable obſtacle to the eſtabliſhment of a free trade; though this would render Macao one of the moſt flouriſhing cities of Aſia, and inconceivably ſuperior to Goa, whoſe utility to its mother-country will never be conſiderable. Beſides the "verendores," there are two judges of orphans, whoſe department includes the adminiſtration of the property of minors, the execution of wills, the nomination of tutors and guardians, and every thing relating to ſucceſſions. From their deciſion an appeal lies to that of Goa. Other civil or criminal cauſes are alſo cognizable, in the firſt inſtance, by two ſenators, who are nominated as judges. A treaſurer receives the produce of the cuſtoms; and his diſburſements, above a certain amount, muſt be ſanctioned by an order of the viceroy of Goa. The moſt important magiſtracy is that of the procurator of the city, which is an intermediate office between the Portugueſe government and that of China. This office is for life; that of the governor is triennial; and the other magiſtrates are replaced every year. An appeal lies to Goa from all the deciſions of the ſenate, which their notorious incapacity renders indiſpenſible. This city is rendered pleaſant in appearance by the fine houſes occupied by the ſupercargoes of the different companies, obliged to winter here; and their ſociety enlivens the place. N. lat. 22° 12′ 40″. E. long. 109°. Groſier. De la Perouſe.

In the folio volume annexed to ſir George Staunton's "Authentic Account of an Embaſſy from the King of Great Britain to the Emperor of China," there is a plan of the city and harbour of Macao; containing references to all the forts, colleges, convents, and other public buildings, and places of note; and alſo the depth of water, and nature of the ground, in every part of the inner harbour, as well as in the ſpace between the peninſula and the northern entrance into the Typa; taken from an accurate ſurvey made by a gentleman long reſident on the ſpot.

Macao, *New*, a ſea-port town of Tonquin, at the bottom of a large bay, full of iſlands. N. lat. 21° 30′. E. long. 107°.

Macao, *Macaw*, in *Ornithology*. See Psittacus *Macao*.

MACAPA, in *Geography*, a town of South America, in the government of Peru, on the north bank of the river of the Amazons, nearly on the equinoctial line. W. long. 52°.

MACAQUO, in *Zoology*, the name of a large ſpecies of monkey called by Mr. Ray *cercopithecus Angolenſis major*, the great Angola monkey. See Simia *Cynomulgus*.

They have another ſpecies of this kind alſo about Angola, which may be called the black macaquo. Its only colour is black; but on many parts of the back and ſides, there is a greyiſh caſt among it: this has a tail of remarkable length, being more than two feet long. See Simia.

MACARAGUA, in *Geography*, a town of the iſland of Cuba; 45 miles N.W. of Havanna.

MACARAUX, in *Ornithology*. See Alca *Arctica*.

MACARIA, in *Geography*, a town on the weſt coaſt of the iſland of Metelin; 10 miles W. of Metelin.

MACARIANS, in *Eccleſiaſtical Hiſtory*, the followers of Macarius, an Egyptian monk, who was diſtinguiſhed, towards the cloſe of the fourth century, for his ſanctity and virtue. In his writings there are ſome ſuperſtitious tenets, and alſo certain opinions that ſeem tainted with Origeniſm. The name has been alſo applied to thoſe who adopted the ſentiments of Macarius, a native of Ireland, who, about the cloſe of the ninth century, propagated in France the error afterwards maintained by Averrhoes, that one individual intelligence or ſoul performed the ſpiritual and rational functions in all the human race.

MACARIUS, St., in *Biography*, a famous anchoret of the fourth century, was a native of Alexandria. He ſpent ſixty years in a monaſtery, and is ſaid to have been a diſciple of St. Anthony, the firſt inſtitutor of a monaſtic life. He died in the year 391, when he was about ninety years of age. Fifty homilies have been attributed to him: theſe were firſt publiſhed in Greek, at Paris, in 1559. He is ſuppoſed to have been the author of many ſmaller tracts, "On Prayer," "Watching the Heart," "Perfection of the Mind," &c. The beſt edition of his pieces is that publiſhed at Leipſic in 1698. Moreri.

Macarius, *St.*, *the Younger*, a celebrated monk, likewiſe a native of Alexandria, who had 5000 monks under his direction. Of his ſanctity, virtues, and abſtinence, wonders are related by Palladius. He was baniſhed by the Arians to an iſland inhabited by heathens, whom he converted to, what was called at that period, Chriſtianity. He died about the year 404, when he was nearly 100 years of age. To him have been attributed "Rules for Monks," in 30 chapters, firſt publiſhed in Latin by Peter Roverius the Jeſuit. Moreri.

Macarius, *St.*, *Deſert of*, in *Geography*, a deſert on the weſt part of Egypt, denominated in honour of a ſaint, to whoſe honour a convent of monks has been founded, anciently called "Nitria." The convent is about 50 miles N.N.W. of Cairo.

MACARON, the name of a ſort of vermicelli, a paſte made of flour and water, and formed in the ſhape of the barrel of a large quill, or the guts of ſmall fowls.

MACARONIC, or Macaronian, a kind of burleſque poetry; conſiſting of a jumble of words of different languages, with words of the vulgar tongue latinized, and Latin words modernized.

Macarone, among the Italians, as has been obſerved by Cælius Rhodiginus, ſignifies a coarſe clowniſh man; and becauſe this kind of poetry, being patched out of ſeveral languages, and full of extravagant words, is not ſo polite and ſmooth as thoſe of Virgil, &c. the Italians, among whom it had its riſe, gave it the name of Macaronian or Macaronic poetry. Others chooſe to derive it *a Macaronibus*, from Macaroons, a kind of confection made of meal not bolted, ſweet almonds, ſugar, and the whites of eggs; accounted a great dainty among the country people in Italy; which, from their being compoſed of various ingredients, occaſioned this kind of poetry, which conſiſts of Latin, Italian, Spaniſh, French, Engliſh, &c. to be called by their name.

Theoph. Folingius, a Benedictine monk of Mantua, was the firſt who invented, or at leaſt cultivated, this kind of verſe: for though we have a Macaronea Ariminenſis in a very old letter, beginning, "Eſt author Typhis Leonicus atque Paranſus;" yet it ſeems to have been the work of Guarinus Capellus Sarſinas, who, in the year 1256, printed ſix books of Macaronic poetry, in Cabrinum Gagamonæ Regem: but as both thoſe came out after the firſt edition of Folingius, which was publiſhed under the name of Merlinus Coccajus in 1520, ſo they were likewiſe much inferior to his in the ſtyle, invention, and epiſodes, wherewith he has enriched the hiſtory of Baldus; which makes the ſubject of his poem. The famous Rabelais firſt transferred the Macaronic ſtyle out of the Italian verſe into French proſe, and on the model thereof formed ſome of the beſt things in his Pantagruel.

We have ſcarce any thing in Engliſh in the Macaronian way, except ſome little looſe pieces collected in Camden's Remains; which is no diſcredit to our authors: for one may ſay of ſuch pieces in general,

> "Turpe eſt difficiles habere nugas,
> Et ſtultus labor eſt ineptiarum."

But the Germans and Netherlanders have had their Macaronic poets; witneſs the "Certamen Catholicum cum Calviniſtis" of one Martinius Hamconius Friſius, which contains about twelve hundred verſes, all the words whereof begin with the letter *C*.

MACAROON. See Macaronic.

MACAROWA, in *Geography*, a town of Poland, in the palatinate of Kiev; 24 miles N.W. of Kiev.

MACARSCA, a town of Dalmatia, and ſee of a biſhop, ſuffragan of Spalatro; ſituated in a territory, formerly pleaſant and fertile, and convenient for commerce, but more lately deteriorated, and ſuppoſed to have ariſen out of the ruins of the ancient Ratanaum or Retinum; 36 miles E.S.E. of Spalatro.

MACARTNEY, George, *Earl of*, in *Biography*, the ſon of George Macartney, eſq. of Auchinleck in Scotland, was born in Ireland in 1737, and was educated as a fellow-commoner in Trinity-college, Dublin, where he took his degrees in 1759. Shortly after this, he travelled with the ſons of the late lord Holland. This, perhaps, was his introduction to court. His education had been liberal, and he had improved the advantages which he poſſeſſed from a fortunate train of circumſtances. He had an aſpiring mind, and excellent talents, and was ambitious of ſome public employment. His own wiſhes were ſeconded by the zeal of his friends, and he was, in 1764, appointed envoy extraordinary to the empreſs of Ruſſia. The object of this miſſion, and of the appointment of this young man, was the great importance of the commercial and political relations between Great Britain and the empire of Ruſſia; and it was neceſſary, at that period, to counteract the influence of France at the Ruſſian court. The character and policy of that court required to be particularly ſtudied: and hence the embaſſy from this country included an office that required much penetration, vigilance, and diſcretion, as well as inſinuating manners, and an agreeable addreſs. Theſe qualifications were thought, by the moſt diſcerning judges, to be united in Mr. Macartney. The principal buſineſs of his miſſion was to negociate a commercial treaty, for the benefit of the Ruſſia merchants trading to Ruſſia. Of the intereſts of the Ruſſian trade he was well informed. His addreſs ſurmounted every difficulty of acceſs to the empreſs and her miniſters: he knew how to ſeize the proper moment for negociation; and he had coolneſs and patience to conquer every obſtacle which might be oppoſed to his views by the artifices of others. He in a ſhort time procured the Ruſſian court to agree to a treaty ſatisfactory to the wiſhes of the Britiſh merchants at Peterſburgh, and ſuitable to the inſtructions which he had received at home. An addreſs from the merchants of the Britiſh factory at St. Peterſburgh; the honour of the knighthood of the Poliſh order of the White Eagle, conferred by a monarch who was himſelf at once a man of faſhion, taſte, and pleaſure, and a man of political talents; and the elevation to the character of ambaſſador extraordinary and plenipotentiary from the Britiſh court, in which he finally concluded the treaty of commerce, were among the teſtimonies of approbation and reſpect which ſir George Macartney obtained by his conduct in this diplomatic miſſion to the north. Thus ſucceſsful and diſtinguiſhed, he returned to the Britiſh court about the cloſe of the year 1767. Early in the following year he married lady Jane Stuart, ſecond daughter of the earl of Bute. By this marriage he had contracted a relationſhip to ſir James Lowther, afterwards the earl of Lonſdale; and by that gentleman's intereſt with, or influence over, the electors, he was choſen, in the ſame year, one of the repreſentatives of the borough of Cockermouth; after which we find him choſen a repreſentative in the Iriſh parliament for the borough of Armagh. In 1769 ſir George was nominated principal ſecretary to the late marquis Townſhend, in the high office which he then filled of lord lieutenant of Ireland. In 1772 he was nominated by his ſovereign knight of the Bath, and in 1775 went out as governor of Grenada and Tobago. He continued there till 1779, when, on the capture of thoſe iſlands by the French, he was taken priſoner, and ſent to France. In 1776 he had been made an Iriſh peer by the title of lord Macartney, baron Liſſanoure, in the county of Antrim. As the loſs of Grenada had not occurred from any miſconduct in him, but the defence of it had indeed been ſignalized by the moſt illuſtrious diſplay of all his great qualities, he met with a very gracious reception from his ſovereign on his return. In 1780 he was choſen to repreſent Beeralſtone in the Britiſh parliament; and in the following winter he was appointed governor and reſident of Fort St. George at Madras, in the Eaſt Indies: and he went without delay to diſcharge the functions of his appointment, where his conduct obtained ſuch univerſal approbation, that, in 1785, he was appointed to the high office of governor-general of Bengal; which honour, however, after due conſideration, he choſe to decline, and returned to England. In 1786 he received a flattering teſtimony of reſpect from the court of directors of the Eaſt India company, who granted him an annuity for his life of 1500*l. per annum*, which was beſtowed as a reward for the important ſervices which this illuſtrious nobleman had rendered to the company. The ſame year he fought a duel with general Stuart, whom he had ſuperſeded in India. In 1788 he took his ſeat for the firſt time in the Iriſh houſe of peers; and about the ſame time was appointed one of the truſtees of the linen manufacture for the province of Ulſter, and alſo cuſtos rotulorum for the county of Antrim. He was promoted likewiſe to the command of a regiment of dragoons in the Iriſh militia. In 1792 he was ſelected as the fitteſt perſon for ambaſſador from the king of Great Britain to the emperor of China. He was on the ſame day nominated a privy-counſellor; and in a few weeks he was raiſed to the rank of an Iriſh viſcount, under the title of viſcount Dervock, in the county of Antrim. He now proceeded, without delay, on his embaſſy, attended by ſir George Staunton as his ſecretary, and a great train of followers and ſervants. A ſhip of war, under the command of ſir Eraſmus Gower, was, with ſmaller veſſels, aſſigned for his voyage. Many rich preſents were ſent from the Britiſh to the Chineſe ſovereign. He arrived in ſafety in the Indian ſeas; and when his approach was announced at the Chineſe court, the emperor and his miniſter agreed, though not without ſome heſitation, to receive the ambaſſadors and preſents. In his approach to Pekin, the northern capital of the empire, his lordſhip was obliged to direct his voyage round the South ſea coaſt of China, by a tract hitherto almoſt unknown to European navigators. The opportunity of exploring that tract was regarded as almoſt ſufficient to compenſate for all the difficulties and expence of the embaſſy. As ſoon as he landed, mandarins of the higheſt rank were appointed to conduct him to the imperial court. His preſents were accepted, and he, with all his train, were treated in a hoſpitable, and even ſumptuous manner: but the main object of the miſſion was completely fruſtrated, *viz.* to obtain permiſſion for the permanent reſidence of a Britiſh ambaſſador at the court of China. This was abſolutely refuſed, and lord Macartney and his train returned over land. His lordſhip entered Canton in December 1793; and from thence he proceeded to Macao; and in March 1794, he ſailed from that port to Europe. He arrived in England in the following September, after an abſence of almoſt two years. On his return he was created an Iriſh earl; and in 1796 he was farther advanced to the dignity of a Britiſh peer, by the title of baron Macartney of Parkhurſt, in Suſſex. After this, he was called to the adminiſtration. In this high ſtation, as in the other offices which he filled, lord Macartney diſplayed qualities which are honourable to his talents as a ſtateſman, and his feelings as a man. His lordſhip died on the 31ſt of March 1806. Monthly and European Magazines. Britiſh and Iriſh Peerages.

MACAS, in *Geography*, a province of the viceroyalty of New Granada, in South America, bounded on the eaſt by the government of Maynas, ſouth by that of Bracamoros and Yaguarſongo, and on the weſt the eaſt Cordillera of the Andes divides it from the juriſdiction of Rio Bamba and Cuença. Its chief town bears the ſplendid title of the city of Macas; and this is better known than its proper ancient name of Sevilla del Oro. It lies in S. lat. 2° 30′, 40′ E. of Quito. Its houſes, which do not exceed 130, are built of timber, and thatched. Its inhabitants are reckoned at about 12,000, who, as well as thoſe of the whole diſtrict, are generally Meſtizos with Spaniards. The other towns belonging to this juriſdiction are San Miguel de Narbaes, Barahonas, Yuquipa, Juan Lopez, Zuna, Payra, Copueno, and Aguayos. The ſpiritual government of all theſe towns is lodged with two prieſts; one of whom, reſiding in the city, has the care of the four firſt; and to the latter, who lives at Zuna, belongs that town and the three others. At the conqueſt, and for ſome time after, this country was very populous, and, in honour of the great riches drawn from its capital, was diſtinguiſhed by the name of Sevilla del Oro; but at preſent only the memory of its former opulence remains. The proximity of Macas to the Cordillera of the Andes occaſions a ſenſible difference betwixt its temperature and that of Quixos adjoining to it. The winter here begins in April, and laſts till September, which is the time of ſummer betwixt the Cordilleras; and at Macas the fine ſeaſon is in September, and is the more delightful on account of the winds, which are then moſtly northward. In grains and other products, which require a hot and moiſt temperature, the country is very fruitful; but one of the chief occupations of the country people here is the culture of tobacco, which, being of an excellent kind, is exported in rolls all over Peru. Sugar-canes alſo thrive well, and likewiſe cotton. Among the infinite variety of trees, which crowd the woods of this country, one of the moſt remarkable is the ſtorax, diſtinguiſhed by the exquiſite fragrancy of its gum. The territory belonging to Macas alſo produces cinnamon trees of an excellent quality. Great quantities of copal are brought from Macas, and alſo wild wax of little value, becauſe it never indurates, and the ſmell of it, when made into candles, and theſe are lighted, is very ſtrong and diſagreeable. Juan and de Ulloa's Voyage to South America, vol. i.

Macas, a town of Africa, in the kingdom of Hoval, near the mouth of the Senegal.—Alſo, a river of Portugal, which runs into the Atlantic, N. lat. 38° 51′. W. long. 9° 25′.

MACASIN, a town on the S. coaſt of the iſland of Midnanao. N. lat. 7° 45′. E. long. 124° 16′.

MACASSAR, or **Macasser**, a ſea-port town of the iſland of Celebes, and the principal ſettlement of the Dutch in this iſland. It gives name to one of the two great kingdoms into which the iſland is divided, and the iſland itſelf is ſometimes diſtinguiſhed by this appellation. Under the article Celebes, the reader will find a particular account of it. Of the town captain Carteret, who viſited it in 1768, gives the following account. (See Hawkeſworth's Voyages, vol. i.) It is built upon a kind of point or neck of land, and is watered by a river or two, which either run through or very near it. It ſeems to be large, and there is water for a ſhip to come within half cannon-ſhot of the walls: the country about it is level, and has a moſt beautiful appearance: it abounds with plantations and groves of cocoa-nut trees, with a great number of houſes interſperſed, by which it appears to abound with people. At a diſtance inland, the country riſes into hills of a great height, and becomes rude and mountainous. The town lies in S. lat. 5° 1′, or 5° 12′. E. long. by account, 117° 28′.

Macassar, *Straight of*, a paſſage between the iſlands of Borneo and Celebes. There is in this paſſage a remarkable point, called by captain Carteret "Hummock Point," but in the French charts denominated "Stroomen Point." N. lat. 1° 20′. E. long. 121° 39′. This point is a good mark for thoſe to know the paſſage that fall in with the land coming from the eaſtward, who, if poſſible, ſhould always make this ſide of the paſſage. To the ſouthward of this point there is a deep bay, full of iſlands and rocks, which appeared to Carteret to be very dangerous. Juſt off the point there are two rocks, which, though they are above water, cannot be ſeen from a ſhip till ſhe is cloſe to the land. To the eaſtward of this point, cloſe to the ſhore, are two iſlands, one of them very flat, long, and even, and the other ſwelling into a hill, but both were covered with trees. Hawkſ. Voy. vol. i.

Macassar *Poiſon*, in *Natural Hiſtory*, called *ippo*, or *upas*, in the Macaſſar and Malayan tongue, is the gum of a certain tree, ſhining, brittle, black, and every way like ſtone-pitch, growing in the iſland of Celebes, in the South Seas; with which all the natives arm themſelves in travel, having a long hollow trunk of a hard red-wood like Brazil, accurately bored, and at one end is fixed a large lance-blade of iron. Then they make a ſmall arrow very ſtraight, and ſomewhat bigger than a large wheaten ſtraw: at one end they fix it into a round piece of white, light, ſoft wood, like cork, about the length of the little finger, juſt fit for the bore of the trunk, to paſs clear by the force of one's breath, and to fill it ſo exactly, that the air may not paſs by, but againſt it, in order to carry it with the greater force. At the other end they fix it either in a ſmall fiſh-tooth for that purpoſe, or make a blade of wood of the bigneſs of the point of a lancet, about three-quarters of an inch long, and making a little notch at the end of the arrow, they ſtrike it firm therein, which they anoint with poiſon. The poiſonous gum, when gathered, is put into hollow bamboos or canes, ſtopped up very cloſe, and thus brought to Macaſſar. When they fit it for uſe, they take a piece of ſmooth turtle ſhell, and a ſtick cut flat and ſmooth at the end: then they take green galangal root, grate it, and with the addition of a little fair water, preſs the juice into a clean china diſh: then with a knife, ſcraping a little of the poiſon upon the ſhell, dip the end of the ſtick in the fore-mentioned liquor, and with this diſſolve the poiſon, to the conſiſtence of a ſyrup: when this is done, they anoint the fiſh-tooth or wooden blade with the ſame ſtick and lay them in the ſun, ſo that it may be baked hard. The pointed arrows thus prepared are put in hollow bamboos, cloſe ſhut, and in this ſtate they retain their virtue for a month. Birch's Hiſt. of the Royal Society, vol. ii. p. 44.

Rumphius, a reſpectable author in Natural Hiſtory, of the 17th century, mentions a tree growing at Macaſſar, to which he gives the name of *Toxicaria;* and relates, that not only the red reſin contained a deadly poiſon, but that the drops falling from the leaves upon the men employed in collecting this reſin from the trunk, produced, unleſs they took particular care in covering their bodies, ſwellings and much illneſs; and that the exhalations from the tree were fatal to ſome ſmall birds attempting to perch upon its branches. But many of the particulars of this account, though far removed from that of the ſuppoſed Upas, or poiſon-tree of Java by Foerſch, who had been for ſome time a ſurgeon in Java, and who had travelled into ſome parts of the interior of the country, are given not upon the author's own obſervation, and may have been exaggerated. Foerſch's relation of a tree ſo venomous as to be deſtructive, by its exhalations, at the diſtance of ſome miles, is compared at Java to the fictions of Baron Munchauſen, or as a bold attempt to impoſe upon the credulity of perſons at a diſtance. Foerſch's account, however, was admitted in a note to Darwin's celebrated poem of the Botanic Garden, and this circumſtance led Dr. Gillan, and others belonging to Macartney's Embaſſy to China, to make inquiries into the fact: and the reſult was as we have above ſtated it. It is, indeed, a common opinion at Batavia, that there exiſts, in that country, a vegetable poiſon, which, rubbed on the daggers of the Javaneſe, renders the ſlighteſt wounds incurable; though ſome European practitioners have of late aſſerted that they had cured perſons ſtabbed by thoſe weapons; but not without the precaution of keeping the wound long open, and procuring a ſuppuration. One of the keepers of the medical garden at Batavia, aſſured Dr. Gillan, that a tree diſtilling a poiſonous juice was in that collection; but that its qualities were kept ſecret from moſt people in the ſettlement, leſt the knowledge of them ſhould find its way to the ſlaves, who might be tempted to make an ill uſe of it. Staunton's Embaſſy, vol. i. p. 273. See POISON.

MACATES, in *Geography*, a town of South America, in the province of Carthagena; 25 miles S.E. of Carthagena.

MACAULAY, CATHARINE, in *Biography*, a diſtinguiſhed writer in hiſtory and politics, the youngeſt daughter of John Sawbridge, eſq. of Ollantigh, in the county of Kent, was born in the year 1733. She appears to have imbibed, from a very early period, a zealous attachment to the principles of liberty, which the hiſtorians of Greece and Rome had infuſed into her heart. The impreſſions made upon her mind in her youth were never obliterated. In 1760 ſhe married Dr. George Macaulay, a phyſician of London. Soon after this, ſhe commenced her career in literature. and in 1763 publiſhed the firſt volume, in quarto, of her "Hiſtory of England, from the acceſſion of James I. to that of the Brunſwick Line." This work was completed in eight volumes in 1783: it was read with great avidity at the period of its publication, but has ſince fallen into ſo much diſrepute, as ſcarcely ever to be enquired after. It was written in the pure ſpirit of republicaniſm, but it unqueſtionably had too much of party ſpirit in it to admit of that partiality which ought to be the characteriſtic of true hiſtory. While in the height of her fame, Mrs. Macaulay excited the admiration of Dr. Wilſon, rector of St. Stephen's, Wallbrook, who conferred on her the unprecedented honour of placing her ſtatue, while living, in the chancel of his church, which his ſucceſſor thought himſelf juſtified in removing. Having been left a widow, Mrs. Macaulay, in 1778, married Mr. Graham, a ſtep, in which the great diſparity of years expoſed her to ſome ridicule. In 1785 ſhe went to America, for the purpoſe of viſiting the illuſtrious Waſhington, with whom ſhe had before maintained a correſpondence. She died in the year 1791. Her works, beſides the hiſtory already referred to, which may be regarded as the principal, are "Remarks on Hobbes's Rudiments of Government and Society;" "Looſe Remarks on ſome of Mr. Hobbes's Poſitions;" the latter being an enlarged edition of the former: the object of theſe is to ſhew the ſuperiority of a republican to a monarchical form of government. In 1770, Mrs. Macaulay wrote a reply to Mr. Burke's celebrated pamphlet entitled "Thoughts on the Cauſes of the Preſent Diſcontents:" and in 1775 ſhe publiſhed "An Addreſs to the People of England, Scotland, and Ireland, on the preſent important Criſis of Affairs." She wrote alſo "A Treatiſe on the Immutability of Moral Truth:" which ſhe afterwards re-publiſhed, with much other original matter, under the title of "Letters on Education." This work was publiſhed in 1790, at a period when men's minds were ready to admit bold theories on almoſt any ſubject, and it obtained much attention from the public. The author ſhewed herſelf an animated writer, and a ſhrewd and acute reaſoner. It will unqueſtionably repay any one, intereſted in the ſubject, the labour of a careful peruſal.

MACAW, MACCAW, or *Macao*, in *Ornithology*, the name of a large ſpecies of parrot, diſtinguiſhed alſo by the length of its tail. See PSITTACUS.

MACAW *Tree*, in *Botany*. See COCOS.

MACAY, in *Geography*, a town of Africa, in the kingdom of Damel. N. lat. 15° 10′. W. long. 15° 55′.

MACBETH. This admirable tragedy of our matchleſs dramatiſt, Shakſpeare, from the ſongs of the witches, as ſet by Matthew Lock in the time of Charles II., was regarded as a kind of opera. See DRAMATIC *Muſic*.

MACBETH, in *Biography*, an uſurper and tyrant, whom the immortal Shakſpeare has conſigned to everlaſting infamy, flouriſhed in Scotland about the middle of the 11th century. At this period Duncan was king, a mild and humane prince, but not at all poſſeſſed of the genius and diſpoſition for governing a country ſo turbulent, and ſo infeſted by the intrigues and animoſities of the great. Macbeth, a powerful nobleman, and nearly allied to the crown, not contented with curbing the king's authority, carried ſtill farther his mad ambition: he murdered Duncan at Inverneſs, and then ſeized upon the throne. Fearing leſt his ill-gotten power ſhould be ſtripped from him, he chaſed Malcolm Kenmore, the ſon and heir, into England, and put to death Mac Gill and Banquo, the two moſt powerful men in his dominions. Macduff next becoming the object of his ſuſpicions, he eſcaped into England, but the inhuman uſurper wreaked his vengeance on his wife and children, whom he cauſed to be cruelly butchered. Siward, whoſe daughter was married to Duncan, embraced, by Edward's orders, the protection of this diſtreſſed family. He marched an army into Scotland, and having defeated and killed Macbeth in battle he reſtored Malcolm to the throne of his anceſtors. The tragedy founded upon the hiſtory of Macbeth, though contrary to the rules of the drama, contains an infinity of beauties with reſpect to language, character, paſſion, and incident, and is thought to be one of the beſt pieces, of the very beſt maſter in this kind of writing, that the world ever produced. "The danger of ambition," ſays Dr. Johnſon, "is well deſcribed; and the paſſions are directed to their true ends." And the author of the Philoſophic Arrangements ſays, "it is not only admirable as a poem, but one of the moſt moral pieces exiſting." Hume's Hiſt. Biog. Dramatica: Shakſpeare Illuſtrated.

MACBRIDE, DAVID, M.D. a diſtinguiſhed phyſician, was born at Ballymony, in the county of Antrim, on the 26th of April, 1726. He was deſcended from an ancient family of his name in the ſhire of Galloway, in Scotland; but his grandfather, who was bred to the church, was called to officiate at Belfaſt to a congregation of Preſbyterians, and his father became the miniſter of Ballymony, where David was born. Having received the firſt elements of his education at the public ſchool of this place, and ſerved his apprenticeſhip to a ſurgeon, he went into the navy, firſt in the capacity of mate to an hoſpital-ſhip, and ſubſequently in the rank of ſurgeon, in which ſtation he remained for ſome years preceding the peace of Aix-la-Chapelle. At this period he was led, from the frequent opportunities of witneſſing the attacks of ſcurvy, which a ſeafaring life afforded him, to inveſtigate the beſt method of cure for that diſeaſe, upon which he afterwards publiſhed a treatiſe. After the peace of Aix, Mr. Macbride went to Edinburgh and London, where he ſtudied anatomy under thoſe celebrated teachers Doctors Monro and Hunter, and midwifery under Smellie. About the end of 1749, he ſettled in Dublin as a ſurgeon and accoucheur; but his youth and remarkable baſhfulneſs occaſioned him to remain a number of years in obſcurity, little employed; although he was endeared to a ſmall circle of friends by his great abilities, amiable diſpoſitions, and his general knowledge in all the branches of polite literature and the arts. In 1764, he publiſhed his "Experimental Eſſays," which were every where received with great applauſe, and were ſoon tranſlated into different languages; and the ſingular merit of this performance induced the univerſity of Glaſgow to confer the degree of doctor of phyſic on its author. The improvement introduced by Dr. Macbride in the art of tanning, by ſubſtituting lime-water for common water in preparing ooze, procured him the honour of a ſilver medal from the Dublin Society, in the year 1768, and of a gold medal of conſiderable value from the Society of Arts and Commerce in London.

For ſeveral years after Dr. Macbride obtained his degree, he employed part of his time in the duties of a medical teacher, and delivered, at his own houſe, a courſe of lectures on the theory and practice of phyſic. Theſe lectures were publiſhed, in 1772, in one vol. 4to., under the title of "An Introduction to the Theory and Practice of Medicine," and a ſecond edition appeared in 1777. It was tranſlated into Latin, and publiſhed at Utrecht, in 2 vols. 8vo. in 1774. This work diſplayed great acuteneſs of obſervation, and very philoſophical views of pathology, and contained a new arrangement of diſeaſes, which was deemed of ſo much merit by Dr. Cullen, that an outline of it was given by that celebrated profeſſor, in his Compendium of Noſology. Of the five claſſes, however, into which Dr. Macbride diſtributed diſeaſes, the genera and ſpecies of the firſt only were detailed.

The talents of Dr. Macbride were now univerſally known, his character was duly appreciated, and his profeſſional emoluments increaſed rapidly; for the public, as if to make amends for former neglect, threw more occupation into his hands, than he could accompliſh either with eaſe or ſafety. Although much haraſſed both in body and mind, ſo as to have ſuffered, for ſome time, an almoſt total incapacity for ſleep, he continued in activity and good ſpirits until the end of December 1778, when an accidental cold brought on a fever and delirium, which terminated his life on the 13th of that month, in the 53d year of his age: his death was ſincerely lamented by perſons of all ranks. See Edin. Med. Commentaries, vol. vii. p. 105. Cullen, Synops. Noſol. Method. vol. i.

MACCABÆUS, Judas, a valiant leader of the Jews, was the third ſon of Mattathias, of the Aſmonæan family, whom he ſucceeded as general of his nation in the year 166 B.C. At this period the Jews were in a ſtate of revolt againſt Antiochus Epiphanes, and Judas, with a ſmall body of men, haraſſed the Syrians, Samaritans, and apoſtate Jews, and filled the country with the terror of his name. After ſome important ſucceſſes, and being left maſter of the field, Judas marched to Jeruſalem, where he purified the city and temple, the latter of which was again dedicated, and a commemoratory feſtival, on this occaſion, was inſtituted, which was ordered to be perpetual. The death of Antiochus gave the Jews ſome reſpite, but hoſtilities were ſoon renewed, and Judas diſplayed his uſual vigour and military proweſs. Lyſias, the commander of the Syrians, was now his chief antagoniſt; him he defeated and obliged to ſeek terms of peace. After this the Syrian general invaded Judea a ſecond time, and obliged Judas to take refuge in Jeruſalem. He beſieged the city, which would, probably, notwithſtanding the valour of its defender, have been obliged to ſurrender for want of proviſions, had not the hoſtile army been haſtily recalled by a rebellion in their own country. After Demetrius Soter had obtained the crown of Syria, the war with the Jews was renewed: Bacchides, marching with the flower of his army, ſurpriſed Judas at the head of a ſmall body of men, of whom, all but eight hundred, deſerted at the approach of the enemy. With theſe he made a deſperate reſiſtance, till he fell upon a heap of ſlaughtered enemies. This was in the year 161 B.C.: the news of his death cauſed the utmoſt grief and conſternation at Jeruſalem, where a general mourning was made for him, and he was celebrated in ſongs, as one of the greateſt heroes of the nation. His body was recovered, and interred in the ſepulchre of his father at Modin. Books of Maccabees. Joſephus.

MACCABEES, two apocryphal books of Scripture, containing the hiſtory of Judas and his brothers, and their wars againſt the Syrian kings in defence of their religion and liberties, ſo called from Judas, the ſon of Mattathias, (ſee Mattathias,) ſurnamed *Maccabæus*, as ſome ſay from the word מכבי, formed of the initials of באלים יהוה מי כמכה, q. d. *Who is like unto thee, O Lord, among the Gods* (Exod. xv. 11.); which was the motto of his ſtandard: whence thoſe who fought under his ſtandard were called Maccabees, and the name was generally applied to all who ſuffered in the cauſe of the true religion, under the Egyptian or Syrian kings. This name, formed by abbreviation according to the common practice of the Jews, diſtinguiſhed Judas Maccabæus by way of eminence, as he ſucceeded his father B.C. 166 in the command of thoſe forces, which he had with him at his death, and being joined by his brothers, and all others that were zealous for the law, he erected his ſtandard, on which he inſcribed the abovementioned motto. Thoſe alſo who ſuffered under Ptolemy Philopater of Alexandria, fifty years before this period, were afterwards called Maccabees; and ſo were Eleazar, and the mother and her ſeven ſons, though they ſuffered before Judas erected his ſtandard with the motto, from which the appellation originated. And therefore, as theſe books which contain the hiſtory of Judas and his brothers, and their wars againſt the Syrian kings, in defence of their religion and liberties, are called the *firſt* and *ſecond* books of the Maccabees; ſo that book which gives us the hiſtory of thoſe, who, in the like cauſe, under Ptolemy Philopater, were expoſed to his elephants at Alexandria, is called the *third* book of the Maccabees, and that which is written by Joſephus of the martyrdom of Eleazar, and the ſeven brothers and their mother, is called the *fourth* book of the Maccabees.

The *firſt* book of the Maccabees is an excellent hiſtory, and comes neareſt to the ſtyle and manner of the ſacred hiſtorians of any extant. It was written originally in the Chaldee language, of the Jeruſalem dialect, and was extant in this language in the time of Jerom, who had ſeen it. From the Chaldee it was tranſlated into Greek, from the Greek into Latin, and alſo into Engliſh. Theodotion is conjectured to have tranſlated it into Greek; but it was probably more ancient, as we may infer from its uſe by ancient authors, as Tertullian, Origen, and others. It is ſuppoſed to have been written by John Hyrcanus, the ſon of Simon, who was prince and high prieſt of the Jews near thirty years, and began his government at the time where this hiſtory ends. It contains the hiſtory of forty years, from the reign of Antiochus Epiphanes, to the death of Simon the high prieſt; that is, from the year of the world 3829, to the year 3869; 131 years before Chriſt. The *ſecond* book of the Maccabees begins with two epiſtles ſent from the Jews of Jeruſalem to the Jews of Egypt and Alexandria; to exhort them to obſerve the feaſt of the dedication of the new altar erected by Judas, on his purifying the temple. The firſt was written in the 169th year of the era of the Seleucidæ, *i. e.* before Chriſt 144; and the ſecond in the 188th year of the ſame era, or 125 before Chriſt; and both appear to be ſpurious. After theſe epiſtles follows the preface of the author to his hiſtory, which is an abridgment of a larger work, compoſed by one Jaſon, a Jew of Cyrene, who wrote in Greek the hiſtory of Judas Maccabæus, and his brethren, and the wars againſt Antiochus Epiphanes, and Eupator his ſon. The two laſt chapters contain events under the reign of Demetrius Soter, the ſucceſſor of Antiochus Eupator, and contain ſuch varieties in their ſtyle, as render it doubtful whether they had the ſame author as the reſt of the work. This ſecond book does not, by any means, equal the accuracy and excellency of the firſt. It contains an hiſtory of about fifteen years, from the execution of Heliodorus's commiſſion, who was ſent by Seleucus to fetch away the treaſures of the Temple, to the victory obtained by Judas Maccabæus over Nicanor; that is, from the year of the world 3828, to the year 3843, 157 years before Chriſt. Calmet.

There are in the Polyglot bibles, both of Paris and London, Syriac verſions of both theſe books; but they, as well as the Engliſh verſions which we have among the apocryphal writers in our bibles, are derived from the Greek. For a further account of Judas Maccabæus, and of his brothers, whoſe hiſtory is recorded in the firſt and ſecond books of the Maccabees, and alſo by Joſephus in his Antiquities; we refer to the article JEWS, and alſo to the biographical article JUDAS MACCABÆUS. The *third* book of the Maccabees contains the hiſtory of the perſecution of Ptolemy Philopater againſt the Jews in Egypt, and their ſufferings under it; and ſeems to have been written by ſome Alexandrian Jew in the Greek language, not long after the time of Siracides. This book, with regard to its ſubject, ought to be called the firſt, as the things which are related in it occurred before the Maccabees, whoſe hiſtory is recorded in the firſt and ſecond books; but as it is of leſs authority and repute than the other two, it is reckoned after them. It is extant in Syriac, though the tranſlator did not ſeem to have well underſtood the Greek language. It is in moſt of the ancient manuſcript copies of the Greek Septuagint, particularly in the Alexandrian and Vatican, but was never inſerted into the vulgar Latin verſion of the bible, nor conſequently into any of our Engliſh copies. The firſt authentic mention we have of this book is in Euſebius's Chronicon. It is alſo named with two other books of the Maccabees in the 85th of the apoſtolic canons. But it is uncertain when that canon was added. Grotius thinks that this book was written after the two firſt books, and ſhortly after the book of Eccleſiaſticus, from which circumſtance it was called the *third* book of Maccabees. Moreover, Joſephus's hiſtory of the martyrs that ſuffered under Antiochus Epiphanes, is found in ſome manuſcript Greek bibles, under the name of the *fourth* book of the Maccabees. This book, aſcribed to Joſephus, occurs under the title "Concerning the Empire or Government of Reaſon;" but learned men have expreſſed a doubt whether this was the book known to the ancients as the *fourth* book of the Maccabees. Philoſtratus, Euſebius, and St. Jerom, knew the book "Concerning the Government of Reaſon," and aſcribed it to Joſephus, by the name of the book of the Maccabees. St. Gregory Nazianzen, St. Ambroſe, and St. Chryſoſtom, in the characters they have given of the ſeven Maccabees, and of old Eleazar, have plainly followed what we find in this book. The author has enlarged and adorned the hiſtory of Eleazar, and of the ſeven brothers the Maccabees, who are ſaid to have ſuffered martyrdom with their mother, as it has been ſaid, chiefly on the authority of Rufinus, who has given the names of the ſeven brothers, and of their mother, at Antioch. (2 Mac. vi. vii.) Others, however, have ſuppoſed, that the ſcene of the martyrdom of the ſeven brethren was at Jeruſalem. As it was deſigned for an example of terror to the Jews of Judæa, it would have loſt its force, if it had been executed any where elſe beſides that country. Thoſe who maintain that they ſuffered at Antioch, allege, that their tombs were ſhewn there in the time of St. Jerom, and that a church, dedicated under their name, was found there in the time of St. Auſtin. The firſt of the ſeven brethren, as the ſtory is related, having declared to the king that he would die ſooner than violate the laws of God, was ſeized by the executioners, who cut out his tongue, and the extremities of his hands and feet, and tore off the ſkin of his hand. While ſtill alive, after being thus mangled, he was thrown into a burning pan, heated over a fierce fire. Such is the account in 2 Mac. vii. 2. 7. The "Government of Reaſon" declares, that the executioner, having ſtripped off his clothes, tied his hands behind his back, and whipped him with ſcourges, without his indicating the leaſt ſign of pain. Afterwards they fixed him upon a wheel, where, after having had his limbs ſhattered to pieces, he expoſtulated with Antiochus, reproached him for his barbarity, and inſulted him on account of all his unſucceſsful attempts. Then the executioner, raiſing the wheel upon which he was extended, and lighting a fire under it, thus conſumed him by a new torture. He died, exhorting his brethren to manifeſt a ſimilar conſtancy. The other brothers alſo ſuffered by the moſt cruel tortures which the king could inflict; but it is needleſs to recount them. The mother of theſe martyrs alſo ſuffered death, as ſome ſay, by throwing herſelf into the fire, to evade the cruelty practiſed on her ſons, and threatened to herſelf. The church of Rome has celebrated a feaſt, Auguſt 1, in honour of theſe martyrs; who were the firſt, and for a long time the only martyrs of the Old Teſtament, in honour of whom altars and temples were erected; and they are the only ſaints of that kind, for whom there remains an office or breviary commemorative in the Roman Breviary. The ſufferings of theſe ſeven brethren, and likewiſe of Eleazar, related 2 Mac. c. vi. are entirely omitted in the firſt book of Maccabees; although the author of it there writes of the Jewiſh affairs, and of the ſufferings of the Jews in the time of Antiochus. We add that there is not any notice taken of this Eleazar, or theſe ſeven brethren, or their mother, by Joſephus, in any of his authentic writings; though he had twice a fair occaſion of mentioning them, once in his "Hiſtory of the Jewiſh War," l. i. and again in his "Antiquities," l. xii. cap. 5. It is preſumed that he would have mentioned a fact ſo remarkable, if it had really occurred. As to the work above-mentioned, "Of the Empire of Reaſon," which has been aſcribed to him, many learned men, as Cave ſays, deny it to be his; and Mr. Whiſton, in his Engliſh tranſlation of all the genuine writings of Joſephus, has omitted this. Dr. Lardner thinks that it was the work of ſome Chriſtian. This hiſtory wants certain internal characters of credibility. The fact itſelf is very extraordinary, inſomuch that it is very improbable, and almoſt incredible. The whole ſtory has the appearance of a contrived fiction. The ſufferers are not deſcribed ſo particularly as they ought to be, and the relations generally are incredible. Beſides, it is improbable that theſe ſeven brothers ſhould have been examined, tortured, and ſlain, one after another, in the preſence of king Antiochus; for ſuch examinations and executions are generally delegated to officers: nor is it ſaid, or even hinted, where theſe perſons ſuffered. It has been ſaid, however, that the writer of the epiſtle to the Hebrews refers to this hiſtory, and thus aſſures us of its truth. (Heb. xi. 35.) But it is very far from being clear or certain, that there is a reference to this hiſtory in that text. Hallet, Lardner, and others, deny it. See Lardner's Works, vol. xi. p. 269, &c.

MACCHERINI, La Signora, in *Biography*, a female Italian ſinger, engaged as firſt woman at the Opera-houſe in 1780, on a falſe report of her great abilities by her countrymen in London, diſappointed every hearer.

MACCHIAVELLI, Nicholas, a celebrated political writer and hiſtorian, was born of a good family, at Florence, in 1469. He firſt diſtinguiſhed himſelf as a dramatic writer, and produced plays that were acted with great applauſe at Rome. Soon after he had entered public life, he was ſuppoſed to have participated in a conſpiracy againſt the houſe and family of Medici; but being "put to the queſtion" on the ſubject, he had the fortitude to endure the torture without uttering the ſlighteſt confeſſion, and was ſet at liberty. He was afterwards raiſed to high honours in the ſtate, and became ſecretary to the republic of Florence, the duties of which high office he performed with great fidelity. He was likewiſe employed in embaſſies to king Lewis XII. of France; to the emperor Maximilian; to the college of cardinals; to the pope, Julius II., and to other Italian princes. Notwithſtanding the revenues which muſt have accrued to him in theſe important ſituations, he left a large family at his death in a ſtate of indigence, a circumſtance that proves he had acted with integrity, and that the love of money had no influence on his mind. He died in 1530. Beſides his plays, his chief works are, 1. "The Golden Aſs," in imitation of Lucian and Apuleius; 2. "Diſcourſes on the firſt Decade of Livy;" 3. "A Hiſtory of Florence;" 4. "The Life of Caſtruccio Caſtracani;" 5. "A Treatiſe on the Military Art;" 6. "A Treatiſe on the Emigration of the Northern Nations;" 7. A Treatiſe, entitled "Del Principe," *the Prince*. This famous treatiſe was firſt publiſhed in 1515, and was intended as a ſequel to his diſcourſes on the firſt decade of Livy, which diſcourſes are replete with juſt and profound reflections on the principles of popular government, and exhibit him as a warm friend of liberty; but "The Prince" has been generally regarded as the manual of a tyrant; all its maxims and counſels being directed to the maintenance of power, however acquired, and by any means. It was dedicated to a nephew of pope Leo X., was printed at Rome, republiſhed in other Italian cities, and was long read with attention, and even applauſe, without cenſure or reply. The practice of politicians at that time was ſo much in uniſon with its maxims, that neither ſurpriſe nor deteſtation ſeems to have been excited by an open expoſure of the uſual arts of government. The writer's intention in this work has been a matter of much controverſy; ſome have held him up as an abandoned promoter of tyranny, and others have maintained that he was its concealed but decided enemy, who meant to put "the people" on their guard againſt its machinations. A modern critic, however, thinks it probable, from the character of the man, that he wrote it without any moral purpoſe whatever; and merely, like a mathematician demonſtrating a problem, inveſtigated the principles by which uſurped power might be maintained, leaving the application to princes or ſubjects, as chance ſhould direct. It has, nevertheleſs, affixed to his name a laſting ſtigma, and Machiaveliſm is become a received appellation for perfidious and infamous politics. When once the ſyſtem was expoſed, a multitude of opponents to it ſtarted up, in almoſt every enlightened country on the globe; among whom, and one of the lateſt, was Frederic the Great, king of Pruſſia, before he commenced thoſe plans of aggrandizement, that he purſued very much in the ſpirit of the work which he had ably anſwered. Of the hiſtorical writings of Machiavel, the "Life of Caſtrucio Caſtracani" is conſidered as partaking too much of the character of a romance; but his "Hiſtory of Florence," compriſing the events of that republic, between the years 1205 and 1494, is a very valuable performance, and one of the earlieſt of the good Italian hiſtories. It was written while the author ſuſtained the office of hiſtoriographer of the republic. He has been charged with miſrepreſentation; but his character, as an hiſtorian, has been ably vindicated, and his ſtyle and compoſition, as a proſe writer, are held in high eſtimation. His verſes do not rank among the firſt, or even the ſecond rate productions of Italian poetry; and his comedies, however they might appear in public repreſentation, are not formed on the pureſt models. The works of this writer were collected in two volumes 4to. in 1550, and they have been republiſhed in Amſterdam, London, and Paris. Gen. Biog. See Machiavelism.

MACCLESFIELD, called in ancient records *Maxfield*, in *Geography*, a populous, corporate, and borough-town of Cheſhire, England, is built on the ſide of a ſteep hill, at the diſtance of 18 miles from Mancheſter, and 166 from London. It is part of the pariſh of Preſtbrug, in the hundred of Macclesfield. Radal, earl of Cheſter, firſt conſtituted it a borough; and in or near the year 1261, the prince of Wales, afterwards king Edward I., made it a free borough, and granted the burgeſſes a mercatorial guild, and other privileges. By the conditions of the charter thus obtained, the burgeſſes were required to grind only at the earl's mill, and to bake at his oven. This oven, or bakehouſe, is ſtill veſted in the crown, and a leaſe of it was granted, in 1791, for twenty-four years and a half. By a charter of queen Elizabeth's, the corporate body was to conſiſt of 24 capital burgeſſes; but a later charter, from king Charles II., names a town-clerk, a coroner, two ſerjeants at mace, &c. as part of the corporation. Among other articles delivered into the cuſtody of the ſerjeants at mace, in the year 1620, was "a bridle for a curſt queane." The market, which is held on Mondays, was formerly very conſiderable for corn, but has declined. The annual fairs are five, principally for cloth, cutlery, toys, and pedlars' ware. The ſilk and cotton trade is carried on in this town to a conſiderable extent, there being nearly thirty ſilk mills, ſome of them on a large ſcale, and about ten cotton factories: a great quantity of goods of both ſorts is alſo manufactured in private houſes; there are ſeveral muſlin, ſilk-weaving, and twiſt factories. The weaving of ſilk handkerchiefs, and the making of ferret and calico, are increaſing manufactures: here are five or ſix dye-houſes, principally for ſilk, a tape manufactory, and a bleaching ground. According to the returns made to parliament under the population act of 1800, the number of houſes was then 1527, the number of inhabitants was ſtated to be 8743, of whom 8509 were ſaid to be employed chiefly in trade, manufactures, or in handicraft. The population has ſince that period been conſiderably increaſed. In the year 1791, an act was paſſed for incloſing the commons and waſte grounds within the borough and manor of Macclesfield. By this act, all encroachments within the manor (except ſuch as had occurred within ſixty years, and had no buildings), were ſecured on certain terms to their reſpective poſſeſſors; the manorial rights of the crown, with reſpect to the ſoil, mines, and minerals of the ſeveral waſte-grounds within the manor and borough were extinguiſhed, with the reſerve of coal-mines: as a compenſation for which conceſſions, an allotment of 118½ acres was made to his majeſty, which allotment, and the right of digging coal, were ſold in 1803, under the land-tax redemption act to Charles Cooke of this town. The corporation are entitled to all ſprings and water-courſes for ſupplying the town with water, from which ſources, with the tolls of the market and fairs, a conſiderable emolument is derived. A court of record is held once a month for the liberty of the hundred, and another for the manor and foreſt; a court leet is alſo held for theſe juriſdictions. In former times the juſtices of Cheſter ſat as juſtices in eyre at Macclesfield, and priſoners for felony and other crimes were tried there, and ſuffered the ſentence of the law. After this practice was diſcontinued, courts were held by the king's ſteward or his deputy. Two ſeſſions are now held in May and November, beſides the monthly courts before-mentioned.

In a ſtreet, called Backwall-Gate, are ſome remains of a manſion of the dukes of Buckingham. Smith, in his deſcription of Cheſhire (1585), deſcribes it as "a huge place, all of ſtone, in manner of a caſtle, which belonged to the duke of Buckingham, but now gone to decay." Webb, writing in 1622, ſays, "in this towne are yet ſeen ſome ruines of the ancient manor-houſe of the renowned duke of Buckingham, who (as yet report goeth) kept there his princely reſidence, about the time of king Edward IV., of whoſe great hoſpitality there, much by tradition is reported."

Other ancient manſions of this town were formerly occupied by families of diſtinction: among theſe was Stapleton-hall, belonging to the Stapletons of Upton; Beate-hall, inhabited by the earl of Courtown, is now a public-houſe; Worth-hall was the town reſidence of the family of Worths: and is traditionally ſaid to have been the birth-place of archbiſhop Savage.

The parochial chapel of this town was originally built by king Edward I. in the year 1278; it was almoſt rebuilt, and greatly enlarged, in 1740. On the ſouth ſide of this chapel is an oratory, or burial chapel, which belongs to the Savage family; ſeveral of whom were interred here. It now belongs to the earl of Cholmondeley. In the Legh chapel are ſome ſepulchral memorials of the family of Legh of Lyme.

A new chapel was erected at Macclesfield in the year 1775, by Charles Roe, eſq. and an act of parliament was obtained in 1779, when it was called Chriſt's-church, or chapel, and the living was made a perpetual cure, or benefice, to be ſubject to the biſhop of Cheſter. In the chancel is a handſome marble monument by Bacon, for the founder, who died in 1781.

In this town are two meeting-houſes for Methodiſts, and one for each of the following ſects: Preſbyterians, Quakers, and Independents. A grammar-ſchool was founded here by ſir John Percival, knt., and not by king Edward VI., as commonly ſtated. This monarch increaſed its revenues, by giving lands and houſes in and near the city of Cheſter. An act of parliament was obtained, in 1768, to regulate the management, and define the conſtitution of this noted ſeminary. Four miles S.S.E. of the town is the townſhip of Macclesfield foreſt. Lyſons's Magna Britannia, vol. ii. part 2. 4to. 1810.

MACDONALD, Andrew, in *Biography*, was born at Leith, where he was educated, chiefly by the aſſiſtance of biſhop Forbes. For ſome time he had the charge of a chapel at Glaſgow, in which city he publiſhed a novel, entitled "The Independent." He afterwards came to London, and wrote for the newſpapers. His works were lively, ſatirical, and humorous, and were publiſhed under the ſignature of Matthew Bramble. He naturally poſſeſſed a fine genius, and had improved his underſtanding with claſſical and ſcientific knowledge; but for want of connections in this ſouthern part of the united kingdom, and a proper opportunity to bring his talents into notice, he was always embarraſſed, and had occaſionally to ſtruggle with great and accumulated diſtreſs. He died in the 33d year of his age, at Kentiſh Town, in Aug. 1790, leaving a wife and infant daughter in a ſtate of extreme indigence. A volume of his "Miſcellaneous Works" was publiſhed in 1791, in which were compriſed; "The fair Apoſtate," a tragedy; "Love and Loyalty," an opera; "Princeſs of Tarento," a comedy; and "Vimonda," a tragedy. Biog. Dramatica.

MACDOWAL's Bay, in *Geography*, a bay on the W. coaſt of the iſland of Java.

MACDUFF, a conſiderable ſea-port town ſituated on the banks of the Moray frith, in the pariſh of Gamvie, and ſhire of Banff, Scotland, at the diſtance of two miles from the county-town. Previous to the year 1732, it was merely a trifling village, compoſed of a few fiſhermen's huts, with no other harbour for their boats but a ſandy creek. It is now, through the exertions of the earl of Fife, on whoſe property it ſtands, a very thriving place. The houſes, which are eſtimated at about 300 in number, are generally built with much neatneſs, and arranged into regular ſtreets of a commodious width. The population exceeds twelve hundred perſons, a great proportion of whom is engaged in the extenſive fiſheries which have been eſtabliſhed on this part of the coaſt. There are ſeveral ſhips belonging to this town employed in the Baltic and London trade. Many veſſels from other ports likewiſe reſort hither; the harbour, formed at the expence of the nobleman already mentioned, being conſidered one of the ſafeſt and moſt commodious in the Moray frith. As this place lies at ſome diſtance from the pariſh church, the ſame noble individual has alſo erected a chapel of eaſe here, and pays a ſuitable ſalary to the clergyman ſettled in it. A great variety of little fiſhing villages lie along the ſhore on both ſides, and on the oppoſite bank of the river Doveran.

MACE, in *Ancient Armoury*, a weapon formerly much uſed by the cavalry of all nations, and likewiſe by eccleſiaſtics, who, in conſequence of their tenures, frequently took the field, but were, by a canon, forbidden to wield the ſword. The mace is commonly of iron; its figure much reſembles a chocolate-mill. Many ſpecimens may be ſeen in the Tower of London, and other armouries. It was not out of uſe long after the invention of hand-guns; for we read of its having been uſed by moſt nations more than 100 years ago; and in a medley, it is ſaid, they may be more ſerviceable than ſwords; for when they are guided by a ſtrong arm, we find that the party ſtruck with them was either felled from his horſe, or, having his head-piece beat cloſe to his head, was made to reel on his ſaddle, with the blood running plentifully from his noſe. This kind of mace, which is the ſame as that uſed by the Turks, is improperly called by ſome military writers the club of Hercules; the club given to that demi-god by the Grecian ſtatuaries, being a huge knotty limb of a tree. Father Daniel has engraved two weapons, ſhewn in the abbey of Roncevaux, as the maces of thoſe famous heroes of romance, Roland and Oliver, who are ſaid to have lived in the time of Charlemagne. One is a large ball of iron, faſtened with three chains to a ſtrong truncheon, or ſtaff, about two feet long; the other is of mixed metal, in the form of a channelled melon, faſtened alſo to a ſtaff by a triple chain: theſe balls weigh eight pounds. At the end of both the ſtaves are rings for holding ends or leathers to faſten them to the hand. Contrivances like theſe, except that the balls were armed with ſpikes, were long carried by the pioneers of the trained bands, or city militia: they are generally called “Morning Stars.” The morning ſtar, or Morgan ſtern, was a weapon formerly uſed for the defence of trenches. It was a large ſtaff, banded about with iron, like the ſhaft of a halbert, having an iron ball at the end, with croſs iron ſpikes.

At preſent the mace is generally made of the precious metals, and highly ornamented and uſed as an emblem of the authority of the officers of ſtate before whom it is carried.

Mace, Thomas, in *Biography*, one of the clerks of Trinity college, Cambridge, in the ſeventeenth century, of quaint and ſingular memory, publiſhed in folio, 1676, a treatiſe, entitled “Muſick's Monument; or, a Remembrance of the beſt practical Muſick, both Divine and Civil, that has ever been known in the World;” a work that muſt not be forgotten among the curioſities of this period. It is impoſſible to deſcribe the ſtyle of this original book by any choice or arrangement of words, but the author's own. The work is divided into three parts; the firſt treats of pſalm-ſinging and cathedral muſic; the ſecond, of the noble lute, “now made eaſy, and all its occult, locked-up-ſecrets, plainly laid open; ſhewing a *general way* of procuring *invention* and playing voluntarily upon the lute, viol, or any other inſtrument, with two pretty devices, &c. In the third part the *generous viol*, in *its righteſt uſe*, is treated upon; with ſome *curious obſervations*, never before handled, concerning it, and muſic in general.”

In pſalm-ſinging the author recommends *ſhort-ſquare-even and uniform ayres*, and is “bold to ſay that many of our old pſalm-tunes are ſo *excellently good*, that art cannot *mend them* or make them better.” In ſpeaking of the difficulty of ſinging in tune, even with a good voice, he obſerves, that “with an *unſkilful-inharmonious-coarſe-grained-harſh-voice*, it is impoſſible. 'Tis *ſad* to hear what *whining*, *toling*, *yelling*, or *ſcreeking* there is in our *country congregations*, where, if there be no organ to compel them to harmonical unity, the people ſeem *affrighted* or diſtracted.”

The liberal uſe of compounds by the ingenious maſter Mace gives his language a very Grecian appearance. He doubts not but that there are “many *rational-ingenious-well-compoſed-willing-good-Chriſtians*, who would gladly *ſerve God* aright, if poſſibly they knew but how;” and therefore he adviſes the purchaſe of an organ of thirty, forty, fifty, or ſixty pounds; and then, “the clerk to learn to *pulſe* or *ſtrike* the pſalm-tunes, which he offers himſelf to teach for thirty or forty ſhillings; and the clerk afterwards may inſtruct all the boys in the pariſh for a ſhilling or two a-piece to perform the buſineſs as well as himſelf. And thus by *little* and *little*, the pariſh will *ſwarm* or abound with organiſts.”

The lute and viol are maſter Mace's favourite inſtruments, concerning the effects of which, and, indeed, of muſic in general, he is a great rapturiſt. On the lute, though “he had occaſion to *break both his arms*, by reaſon of which he could not make the *nerve-ſhake well*, nor ſtrong; yet, by a certain *motion of his arm*, he had gained ſuch a *contentive-ſhake*, that his ſcholars aſked him frequently how they ſhould do to get the like?”

We ſhall not attempt to recreate our readers with more extracts from this matchleſs, though not ſcarce, book; but recommend its peruſal to all who have taſte for exceſſive ſimplicity and quaintneſs, and can extract pleaſure from the ſincere and undiſſembled happineſs of an author, who, with exalted notions of his ſubject and abilities, diſcloſes to his reader every inward working of ſelf-approbation in as undiſguiſed a manner, as if he were communing with himſelf in all the plenitude of mental comfort and privacy. We ſhall, however, preſent ſuch readers with an advertiſement from good maſter Mace, that was written on his arrival in London, 1690, fourteen years after the publication of his book. We found it in the Britiſh Muſeum, N° 5936, in a collection of title-pages, devices, and advertiſements.

An Advertiſement.

“To all Lovers of the beſt *Sort* of *Muſick*.”

“Men ſay the times are ſtrange——'tis true:
'Cauſe many ſtrange things hap to be.
Let it not then ſeem ſtrange to you
That here one ſtrange thing more you ſee.”

“That is, in Devereux-court, next the Grecian coffee-houſe, at the Temple back-gate, there is a deaf perſon teacheth muſic to perfection; who, by reaſon of his great age, v. 77, is come to town, with his whole ſtock of rich *muſical furniture*, v. inſtruments and books to put off, to whomſoever delights in ſuch choice things; for he has nothing light or vain, but all *ſubſtantial* and ſolid MUSIC. Some particulars do here follow:

“1. There is a late invented ORGAN; which (for private uſe) excels all other faſhioned organs whatever; and for which, ſubſtantial-artificial *reaſons* will be given; and (for its beauty) it may become a nobleman's dining-room.

“2. There belongs to it a pair of fair, large-ſized *conſort-viols*, chiefly fitted and ſuited for That, or conſort uſe; *and 'tis great pity they ſhould be parted.*

“3. There is a *pedal harpſicon* (the abſolute beſt ſort of *conſort harpſicons* that has been invented); there being in it more than twenty *varieties*, moſt of them to come in with the foot of the player, without the leaſt hindrance of play (exceedingly pleaſant). And

“4. Is a ſingle *harpſicon*.

“5. A new invented inſtrument, called a *dyphone*, v. a *double lute*; it is both *theorbo* and *French-lute* complete; and as eaſy to play upon as any other lute.

“6. Several other *theorbos*, *lutes*, and *viols*, very good.

“7. Great ſtore of choice collections of the works of the *moſt famous compoſers*, that have lived in theſe laſt hundred years, as Latin, Engliſh, Italian, and ſome French.

“8. There is the *publiſher's* own *Muſick's Monument*; ſome few copies thereof he has ſtill by him to put off; it being a ſubſcribed book, and not expoſed to common ſale. All theſe will be ſold at very eaſy rates, for the reaſons aforeſaid; and becauſe (indeed) he cannot ſtay in town longer than four months (exactly).”

He farther adds, “if any be deſirous to partake of his experimental ſkill in this *high-noble-art*, during his ſtay in town, he is ready to aſſiſt them; and (haply) they may obtain that from him, which they may not meet withal elſewhere. He teacheth theſe five things, v. the *theorbo*, the *French-lute*, and the *viol*, in all their excellent ways and uſes; as alſo *compoſition*, together with the *knack* of procuring *invention* to young compoſers (the general and greateſt difficulty they meet withal), this laſt thing not being attempted

tempted by any author (as he knows of), yet may be done; though ſome has been ſo wiſe (or otherwiſe) to contradict it:

"Sed experientia docuit."

"Any of theſe five things may be learned ſo underſtandingly, in this little time he ſtays (by ſuch general rules as he gives, together with *Muſick's Monument*, written principally to *ſuch purpoſes*), as that any aptly inclined, may (for the future) teach themſelves without any other help."

Mace, Francis, a learned French prieſt, was born at Paris about the year 1640, and being deſigned for the church, he purſued his ſtudies with that view at the univerſity of his native city, where he took his degrees. His firſt public employment was that of ſecretary to the council for managing the domains and finances of the queen, conſort to Lewis XIV. It was not till the year 1685 that he took holy orders, when he was immediately appointed canon, veſtry-keeper, and rector of the royal collegiate and parochial church of St. Opportune, at Paris. He was a very diligent ſtudent as well in profane as in ſacred literature, and was celebrated for his popular talents as a preacher. He died in 1721, leaving behind him a great number of works that do honour to his memory, of which we ſhall mention "A Chronological, Hiſtorical, and Moral Abridgment of the Old and New Teſtament," in 2 vols. 4to.; "Scriptural Knowledge, reduced into Four Tables;" a French verſion of the apocryphal "Teſtaments of the Twelve Patriarchs;" of which Groſſeteſte, biſhop of Lincoln, gave the firſt Latin tranſlation, Grabe the firſt Greek edition, from MSS. in the Engliſh univerſities, and Whiſton an Engliſh verſion; "The Hiſtory of the Four Ciceros," which abound in learned and curious enquiries, and intended to prove, from the teſtimony of Greek and Latin hiſtorians, that the ſons of Cicero were as illuſtrious as their father. Moreri.

Mace, in *Commerce*, a ſmall gold coin, current in Sumatra, and ſome other Eaſt India iſlands. It weighs nine grains, and is worth about 14*d.* ſterling. Sixteen mace are equal 64 copangs = 4 pardows = a tale: and 2500 ſmall pieces of tin or lead, called caſhes, uſually paſs for a mace.

Mace, *Macis*, is a pretty thick, tough, unctuous membrane, reticular or variouſly chapt, of a lively reddiſh-yellow colour, approaching to that of ſaffron, enveloping the ſhell of the fruit, whoſe kernel is the nutmeg. The mace, when freſh, is of a blood-red colour, and acquires its yellow hue in drying. It is dried in the ſun, upon hurdles fixed above one another, and then, as it is ſaid, ſprinkled with ſea-water, to prevent its crumbling in carriage.

Mace has a pleaſant aromatic ſmell, and a warm, bitteriſh, moderately pungent taſte; it is a thin and flat membranaceous ſubſtance, of an oleaginous nature, and of a yellowiſh colour. We meet with it in flakes of an inch or more in length, which are divided into a multitude of irregular ramifications; it is of an extremely ſmooth ſurface, and of a tolerably cloſe texture, yet friable, and very eaſily cut to pieces. It is of an extremely fragrant, aromatic, and agreeable ſmell, and of a pleaſant, but acrid and oleaginous taſte; it is to be choſen new, not dry, and of a fragrant ſmell, tough, oleaginous, and of a good yellow. The people who collect the nutmeg fruit cut it open, and throw away the pulpy ſubſtance, or external coat; they then ſee the mace covering the nutmeg, wrapping itſelf every where round its outer woody ſhell. The mace is at this time of a red colour; they take it carefully off from the nutmeg, and lay it in the ſun for the whole day. In this time its colour, from a ſtrong blood-red, becomes duſky; it is after this carried to another place, where the ſun has leſs power, and there expoſed again to its rays, the few hours they reach thither. By this means it dries gently, and remains tough, and retains its fragrancy and colour in a great degree: if it were dried more haſtily, it would be whitiſh, brittle, and would loſe much of its ſmell; after this it is ſlightly ſprinkled over with ſea-water, and then put up into bales in which it is preſſed down firm and cloſe, by way of preſerving its fragrance and conſiſtence.

It is of an aſtringent and drying nature, and is uſed as a corrector in cardiac and cathartic compoſitions. In its general quality it is nearly ſimilar to the *nutmeg*, which ſee; the principal difference conſiſts in the mace being much warmer, more bitteriſh, leſs unctuous, and ſitting eaſier on weak ſtomachs; in its yielding by expreſſion a more fluid oil, and in diſtillation with water a more ſubtile volatile one. Lewis's Mat. Med.

Mace, *Oil of*, is a kind of ſebaceous matter, ſaid to be expreſſed from the nutmeg, and appearing to be a mixture of the groſs ſebaceous matter of the nutmeg, with a little of the eſſential or aromatic oil; both which may be perfectly ſeparated from one another by maceration or digeſtion in rectified ſpirit, or by diſtillation with water. The beſt ſort of this oil is brought from the Eaſt Indies in ſtone jars, and is ſomewhat ſoft, of a yellow colour, and of a ſtrong agreeable ſmell, much reſembling that of the nutmeg itſelf. There is another ſort brought from Holland in ſolid maſſes, generally flat, and of a ſquare figure of a paler colour, and much weaker ſmell. Lewis.

Mace, *Reed*, in *Botany*. See Typha.

MACEDA, in *Geography*, a town of Spain, in the province of Galicia; five miles S.E. of Santiago.

MACEDO, Fr. Francisco de Santo Agostinho, in *Biography*, a learned Portugueſe, was born at Coimbra in 1596, and at a very early age diſcovered premature and extraordinary proofs of memory and imitation. At the age of eleven he could repeat the whole of the Æneid, and compoſe good Latin verſes. He joined the company of the Jeſuits, which he quitted, and entered the Franciſcan order in the reformed province of St. Antonio. When the Braganzan revolution broke out, Macedo eſpouſed the patriotic ſide, was called to political exertions, and viſited Rome, Paris, and London with ambaſſadors of Joam IV. As he advanced in years he retired to Rome, where he obtained the profeſſorſhip of eccleſiaſtical hiſtory, and other offices in the college De Propaganda Fide; for ſome time he performed all the high duties attached to his ſeveral ſtations with credit, and to the entire ſatisfaction of the pope, whoſe favour he forfeited for refuſing to expunge a word in an epitaph written upon a ſervant of his holineſs. At Rome, and alſo at Venice, he engaged in many learned diſputes with characters of the firſt literary reputation. To all his opponents Macedo replied moſt readily and without the ſmalleſt embarraſſment, correcting their falſe quotations, and confuting their arguments; and he is ſaid to have crowned the whole by reciting a thouſand extempore verſes, and an epigram in praiſe of the city of Venice, which epigram was by order of the republic written under his picture, and placed in the library of St. Mark. From the wonderful powers of his memory he obtained the title of the walking Cyclopædia. He died in 1681, at the great age of eighty-five. He left a vaſt multitude of works either in manuſcript or in print; he eſtimated the number of verſes which he had made at a million and a half. Of this prodigious number, ſays Mr. Southey, nobody now reads a ſingle line. Gen. Biog.

MACEDONIA, in *Ancient Geography*, a country of Europe, diſtinguiſhed by various appellations, belonging to one or other of its diſtricts, according as the people who inhabited thoſe diſtricts happened to prevail. In the moſt ancient times it took its name from Æmathia, a denomination derived from Æmathius, a prince of great antiquity; but afterwards the Greeks called it Macedonia, either from king Macedo, a deſcendant, as ſome pretend, from Deucalion, or, as others ſay, by an eaſy change of Mygdonia, the name of one of its provinces, into Macedonia. Its boundaries have been very various, ſometimes more extended and ſometimes more confined, according to the good or bad fortune of its reigning princes. It was bounded originally on the E. by the Ægean ſea, on the S. by Theſſaly and Epirus, on the W. by the Adriatic, or the Ionian ſea, and on the N. by the river Strymon and the Scardian mountains, afterwards by the river Neſſus, or Neſtus. Pliny ſays, that no leſs than 150 different nations were ſeated within its territory, and Mela tells us, that it had as many nations as cities; but in the time of Ptolemy, it appears from his geography, that this number was very conſiderable. Livy (c. xxx.) comprehends the ſeveral diviſions of Macedonia under four principal parts, which he deſcribes as follows: "Pars prima, Biſaltas habet fortiſſimos viros: trans Neſſum amnem incolunt et circa Strymonem, &c." This part was fertile, contained mines, and had for its principal town Amphipolis, which guarded the entrance into Macedonia, towards the eaſt. "Secunda pars, celeberrimas urbes Theſſalonicam et Caſſandriam habet." To this part was joined Pallena, a country very fertile, and abundant in grain, and having good ports. "Tertia regio, nobiles urbes Edeſſam et Beræam, et Pellam et Vettiorum bellicoſam gentem: incolas quoque permultos Gallos et Illyrios impigros cultores." "Quartam regionem Eordæi, et Lynceſtæ, et Pelagones incolunt. Juncta his Atintania et Stymphalis et Elimiotis." Cellarius diſtinguiſhes "Macedonia propria," from Macedonia adjuncta." Macedonia propria, or Macedon proper, contains the following parts. 1. In this part were the *Alompii* in the north, where the mountains Hæmus and the Scardus join. This country is called Almopia by Thucydides; and Livy places here mount Boreas. *Pelagonia*, called by Strabo τριπολις, becauſe it contained three towns, though Ptolemy aſſigns to it only two, is the fourth region of Livy, ſuppoſed to be the ſame with *Pæonia*. *Lyceſtis* or *Lynceſtis*, inhabited by the Lynceſtæ, lay to the S.W. of Pæonia. The chief town was Heraclea. *Eordæa*, inhabited by the Eordæi, was ſituated W. of the Lynceſtæ, or between the country of the Taulantii and Oreſtes. North of theſe was the territory of the Daſſaretæ, whoſe chief towns were Lychnides and Evia. The former was called Lychnidia by Polybius, and was pleaſantly ſituated near a lake of the ſame name. It is now called Ochrida. To this part belonged alſo a portion of *Elymiotis*; the reſt was in Illyria, as well as Candavia. 2. The ſecond part was compriſed between the rivers Erigon and Axius. Here are found the famous towns of Edeſſa, Berœa, and Pella. Livy places in this part the famous nation of Vettii. Towards the north lies a portion of Pæonia, called *Deuriopus*, which, according to Strabo, had three towns, *viz.* Bryanium, Alalcomenæ, and Stybæra. In the part of Pæonia, which was on this ſide of the Axius, was Armiſſa, which, according to Thucydides, was the firſt town of the kingdom of Perdiccas. *Æmathia* was the moſt conſiderable part of Macedonia, ſo as formerly to have given it its name; in which country we find Tyriſſa, Scydra, Meyza; and ſince among the *Cyrrheſtæ*, Cyrrhus, Idomené, Gortynia or Gordynia, Æge, and Pella. Towards the ſea was the ſmall country, called *Bottiæa*, or *Bottiætis*. As Herodotus attributes to this ſmall country the towns of Ichnæ and Pella, Cluvier conjectures that Æmathia was enlarged by its encroachments on this province. *Pieria* lay to the ſouth of this ſmall country, and in proceſs of time comprehended Bottiæa. In Pieria were the towns of Alorus, Methone, Pidna, called Citron, Dium, and others leſs conſiderable. The river Enipeus, flowing from the vallies of mount Olympus, diſcharged itſelf into the ſea, ſouth of Dium, and at its mouth was Phyla, a ſtrong town, built by Demetrius Gonatas. 3. The third part of Macedonia, according to Cellarius, was comprehended between the rivers Axius and Strymon; and this is the ſecond according to the diſtribution of Livy. In this part are found *Amphaxitis*, E. of the mouth of the Axius, on the Thermaic gulf. The moſt conſiderable town was Therma, which afterwards took the name of Theſſalonica, and is now called Salonichi. *Mygdonia* lay to the N. of the Thermaic gulf, but did not extend to the ſea. Here were the towns of Antigonea and Stobi, Phyſca, Terpillas, Aſſorus, and Xylopolis; and by extending this part towards the ſouth, it will be made to comprehend the towns of Apollonia and Arethuſa. Thucydides places immediately after Mygdonia, *Greſtonia*, *Anthemus*, and *Biſaltia*. *Anthemus* probably derived its name from the town of Anthemus, placed by M. d'Anville towards the E. of Amphaxitis, near the ſource of the Rechius. *Greſtonia* or *Creſtonia*, was ſituated N.E. of Amphaxitis, and had a town of the ſame name. The Echedorus had its ſource in this country, and ran from hence into Mygdonia. *Sintice* and *Biſaltia* lay towards the N. and N.E. of Creſtonia, upon the Pontus, between the mountains, and had a town named Heraclea Sintica. *Biſaltia* was a country inhabited by the Biſaltæ, who occupied a territory near the river Strymon. Another conſiderable part of Macedonia was comprehended in a peninſula, which projected between the Thermaic gulf to the weſt, and the Strymonic gulf to the eaſt. Towards the N.W. was the ſmall country called *Greſſæa*; ſouthwards from the ſea to the E. was Chalcidica, terminated by three long peninſulas, paſſing in a direction from N.W. to S.E. The moſt weſterly was called *Pallena*, which had formerly borne the name of *Phlegra*; the next was *Sithonia*; and the third was a peninſula joined to the continent by a tongue of land, in which was ſituated mount Athos. On the weſtern coaſt is *Croſſæa*, with its towns Ænia or Ænea, Gigonus, Smyla, Antigonea, Combrea, and Lipaxes or Lipaxus. Upon the iſthmus which connects *Pallena* with the continent, was the town called Potidæa, and afterwards Caſſandra; to the W. were the towns Sana, Menda, Scione, and Thrambus or Therambus. At the extremity of the S.E. was *Canaſtræum Promontorium*, together with a place of the ſame name. Upon the eaſtern coaſt were Æga and Aphitis. Between the eaſtern coaſt of *Pallena* and the weſtern coaſt of *Sithonia*, the ſea formed a gulf, called *Toronaicus Sinus*; at the bottom of this gulf, on an eminence, was the town of Olynthus, ſeparated from the gulf by the Bolyca palus, a marſh into which were diſcharged the two ſmall rivers Olynthius and Amnias. Upon the weſtern coaſt of *Sithonia* were the towns of Mecyberna, Sermyla, Galepſus, and Torone, whence the Toronaic gulf derived its name. At the weſtern extremity of this peninſula was the *Promontorium Derris*, and at the S.E. point was the *Promontorium Ampelos*. On the eaſtern ſide were Sarga, Singus, Pidaurus, and Aſſa, at the mouth of the Chabrius. The gulf, which bathed this coaſt, had taken its name from Singus, ſituated at the entrance of a very large bay. The peninſula, in which ſtood mount Athos, had ſeveral places ſituated along the ſea coaſt. On the coaſt towards the N. were Sana, Cleonæ, Thyſſum, near the *Promontorium Nymphæum*. Upon the coaſt towards the S.E. at the foot of the mountain, was Apollonia, and the promontory that bore the name of *Acro-Athos Promontorium*. Towards the N.W. were the towns of Olophyxus, Dium, and Acanthus, ſituated in a bay in which Xerxes would have brought his ſhips into the Singitic gulf when he meant to cut through Athos, in order to prevent the neceſſity and danger of doubling the two promontories, Acro-Athos and Nymphæum. To the N., on the ſame coaſt, are Stagyra, Arna, Arethuſa, Bromiſcus, Argilus, and Eion at the mouth of the Strymon, where alſo was Amphipolis.

The *Macedonia adjecta* of Cellarius, was that which was taken from Thrace in the time of Philip, and extended from the river Strymon on the W. to the Nyſſus on the E. Amphipolis, the port of which was Eion, belonged to this part. Cluverius places alſo in this part the town of Berga, but it really lay W. of the river. From Berga was derived the proverbial expreſſion Βεργαιζειν αντι τȣ μηδεν αληθες λεγειν, Bergaizare, id eſt, nihil veri dicere, for exaggeration, or ſaying any thing that was ſcarcely credible. To the E. of Strymon was Gazolus; on the ſea-coaſt, beyond Eion, were Phagres, Gapſelus, Æſyma, and Neapolis. In the inland territory was Philippi, formerly called Crenides and Datus, and which under its latter name became a Roman colony; and towards the W. Drabeſcus, Triuilum, Domerus, &c.

Macedonia was interſected by many Roman ways, the moſt ancient of which was called *Via Egnatia*. It was thought to have been a continuation of this Roman way, that terminated at Brundufium; it commenced at Dyrrachium, whence it paſſed by Hydrantum to Aulon, on the coaſt of Epirus. From each of theſe towns it branched off to Claudiana. From this place it paſſed to Lichnidus, belonging to the Daſſaretii, and thence turning to the S., it paſſed by Heraclea, belonging to the Lynceſtæ, by Edeſſa, Pella, Theſſalonica, Apollonia, Amphipolis, Philippi, Neapolis, and the reſt of Thrace, as far as Cypſelus or Cypſela on the Hebrus. Some authors have continued it as far as Conſtantinople.

Ptolemy extends Macedonia as far as the Ionian ſea, and aſſigns as its boundaries on the N. Dalmatia and Mœſia, and on the weſt Thrace. On the coaſt he places the Taulantii, then the Elymioti, Oreſtis, Edonis and Odomantice on the Strymonic gulf, and on the ſame gulf Amphaxitis, then Chalcidica, Paraxiæ on the coaſt, Pieriæ on the Thermaic gulf, the Pelaſgioti on the coaſt, Phthiotis on the Pelaſgic gulf; and northwards, towards the W., &c. the Albani, the Almopi, Orbellæ, the Eordati, the Eſtræi, Joranum, Sintices, the Daſſaretii, Lyceſtis, Pelagonia, Biſaltiæ, Mygdonia, Emathia, the Parthyæi, Stymphaliæ, the Eſtioti, and the Theſſalii. The iſlands which he aſſigns to Macedonia were Saſo in the Ionian ſea, and in the Ægean ſea, Lemnos with its two towns Myrina and Hephæſtia, Scixthos with a town of the ſame name, Scopelos, and Scyros with a town of the ſame name.

According to M. de l'Iſle's map of Greece, the extent of Macedonia from N. to S. was about 160 miles, and from W. to E. about 220. Its form was very irregular; but its ſituation was excellent, its ſhores being waſhed on the E. by the Ægean, and on the W. by the Ionian ſeas: but theſe advantages with regard to navigation and commerce, were never well improved; as the Macedonians were never powerful at ſea, notwithſtanding the many noble bays and excellent harbours which their coaſt afforded.

Among the moſt conſiderable mountains of this country, we may reckon the great ridge, which traverſed the northern part, called the Scardian mountains. In this part alſo was ſituated mount Pangæus, which was lofty and well covered with wood, and which was more valuable on account of its mines of gold and ſilver. From Thrace it was divided by mount Hæmus, which towards the W. joined the Scardian hills. Athos, in the Chalcidian region, was one of the moſt celebrated mountains in the world. (See ATHOS.) Olympus was alſo another mountain, that was ſo lofty as to reach almoſt the confines of heaven, whence the poets took the liberty of making it the ſeat of the gods. (See OLYMPUS.) The Scardian hills and mount Athos were well covered with woods; and, indeed, the whole kingdom of Macedonia, being every where intermixed with mountains and riſing grounds, abounded with all ſorts of trees, that were valuable on account either of timber, fruit, or ſhade. The ſeas that adjoined it were the Adriatic, which afforded ſeveral ſafe ports, beſides the great haven of Epidamnus, now Durazzo; and the Ægean ſea, which opened to this country not only the trade of Greece, but that of Aſia. Its bays were ſpacious, and four of them were eſpecially remarkable; *viz.* Sinus Strymonicus, which encloſed in its boſom the iſland of Thaſus, and is now called Golfo di Conteſſa:—Sinus Singiticus, having on one ſide mount Athos, and on the other a long ſlip of land, once full of rich and populous towns, now ſtyled Golfo di Monte Santo:—Sinus Toronaicus, having the ridge of land juſt mentioned on one ſide, and part of the region Paraxia on the other, now called Golfo di Aiomama:—and Sinus Thermæus, 60 miles in length, now called the gulf of Salonichi. Of the rivers of Macedonia, thoſe that fell into the Adriatic were the Panyaſus, the Apſus, the Laous, called alſo Æas and Aous, and Celydnus or Pepylichus, which is conſidered as the boundary between Macedon and Epirus. The rivers that diſcharged themſelves into the Ægean ſea were the Aliacmon, the Erigon, the Axius (ſee AXIUS), and the Strymon, the ancient boundary between Macedon and Thrace, but ſince the time of Philip this boundary has been the Neſſus. As to the lakes of Macedonia, beſides thoſe formed by the overflowing of the river Strymon, and the junction of the rivers Axius and Erigon, there is almoſt in the centre of the country, not far from the Candavian mountains, a large and famous lake, called the lake of Lychnidus, or the lake of Preſpa. There is alſo another lake in the province of Mygdonia; and a third near the ancient city of Sintia, called afterwards Heraclea Sintica.

The climate of Macedonia was ſalubrious and favourable to longevity; the ſoil was generally fertile, eſpecially on the ſea-coaſt, producing in abundance corn, wine, and oil; but the principal riches of Macedonia conſiſted in its mines of almoſt all kinds of metals, but more particularly of gold. The Romans, when they reduced Macedonia into a province, reſtrained the inhabitants from digging or refining gold or ſilver, but left them at liberty with regard to any other metal. In ancient times Macedonia abounded with horſes above all the other countries of Greece. Three hundred ſtallions, and 30,000 mares, were kept in the royal ſtud near Pella.

MACEDONIA, *Hiſtory of*. This country was originally inhabited by many nations. Thoſe from whom the race ſprang, which from ſmall beginnings became lords of Greece, were Argives. Under the conduct of Caranus, who was deſcended from Hercules by his ſon Temenus, they came into this country about 814 years B.C., and eſtabliſhed themſelves by their arms. Their dominion was afterwards conſiderably enlarged by their prudence as much as by their valour; for erecting no trophies after their victories, and treating thoſe whom they had ſubdued with the tenderneſs of brethren, they engaged the affections of the conquered, with whom they aſſociated as one people, and thus various tribes were reduced into one nation. Although the Macedonians were always governed by kings, they preſerved as great or even greater liberty than moſt of the Grecian commonwealths: their monarchs always ruling them according to the maxims of natural equity. This was the original conſtitution, and it may be ſaid, very much to their honour, that it was not ſubverted but with the kingdom. In caſes where the puniſhment was capital, the cauſe was heard by the army or by the people; and till they condemned the party, the king did not pretend to put him to death. Alexander in many inſtances adhered to this cuſtom; although a rigid regard to the conſtitution of his country was not always the ruling principle in a Macedonian monarch, as we are informed by Polybius. The throne was hereditary; and continued in the race of Caranus, till the ſlaughter of Alexander's family; and in general the eldeſt ſon ſucceeded. The ancient kings of Macedon made no oſtentatious diſplay of regal dignity. Alexander the Great was the firſt who wore a diadem and rich robes of ſtate, which were transferred to his ſucceſſors. The people were loyal and attached to their prince. With regard to marriage, the Macedonian kings were not very ſcrupulous; as they had frequently ſeveral wives and a number of concubines. In the education of their children they were very exemplary, their ſons being placed under the tuition of the beſt maſters, who inculcated the love and practice of great and glorious actions; and their daughters were initiated in the practice of every virtue. In the conduct of their own affairs they were moderate and prudent, affecting no magnificent entertainments, condeſcending to their ſubjects, and habituated to buſineſs. Their chief diverſion was hunting. Theſe princes were generally learned, or at leaſt patrons of learned men. In the moſt ſolemn acts of their adminiſtration, they maintained ſuch a decorum as rather endeared them to than awed their ſubjects. They heard cauſes in perſon, and ſuffered thoſe who pleaded before them to ſpeak with the greateſt freedom. After their deaths, the Macedonian kings were interred in the royal ſepulchre; and as they were beloved whilſt they lived, the people mourned for them when they died as for their common parents.

The Macedonians, with reſpect to religion, followed the opinions embraced by the reſt of the Greeks, worſhipping many gods, and indulging a great variety of ridiculous rites. Jupiter, Hercules, and Diana, were the objects of their ſpecial reverence. They were ſtrict in their morals, and temperate in their ordinary mode of living, but magnificent and ſelf-indulgent in their feaſts. At theſe feaſts no women were admitted; and it was an inviolable rule that nothing ſhould be divulged, that paſſed at their convivial meetings. They uſed their captives as concubines, but held it diſhonourable to marry them. In capital caſes, judgment was given by the voice of the army; in caſes of doubt torture was allowed; and their puniſhments were various. Sometimes, but chiefly on extraordinary occaſions, and in conformity to foreign cuſtoms, the criminal was thruſt through with darts, or crucified with his head downwards, or thrown chained into rivers; however, the moſt frequent puniſhment, and that which ſeems to have been legal, was ſtoning to death, in which the army, as they had been conſtituted judges, were executioners.

As there were ſeveral mines in Macedonia, there was under its ſeveral kings a variety of ſilver and gold coins; of the latter ſort were the Philippics, ſo called from bearing the buſt of Philip, the father of Alexander. Theſe were for a long time the moſt current coins in Greece.

The language of the Macedonians differed very much from the ſeveral dialects of the Greek; inſomuch that the natives of Greece, who ſerved in Alexander's army, were not able to underſtand a diſcourſe delivered in the Macedonian tongue.

Their military diſcipline deſerves particular notice, as it ſerved to raiſe them from being a mean and obſcure people to be lords of Greece. At firſt they were brave and warlike, and by degrees they became invincible from the union of ſuperior courage with military ſkill. Their army conſiſted of their natural born ſubjects, their allies, and mercenaries. The natives ſerved at their own expence, and contented themſelves with the ſpoil of their enemies. The allies were compoſed of the reſpective quotas of Theſſaly, Pæonia, and other dependent provinces, and of auxiliary troops furniſhed by Greece. The mercenaries were ſoldiers of fortune, who ſerved only for pay. The Theſſalians furniſhed horſe, and there were alſo many troops of Macedonian cavalry; the diſcipline of which was ſo ſtrict, that if any of the private men loſt their horſes, either by ſickneſs or in action, their officers were obliged to furniſh others out of their own ſtables. The infantry were compoſed of three bodies, *viz.* the light-armed, the peltaſtæ, who were better armed, and the heavy-armed ſoldiers, of whom the phalanx was compoſed. Theſe troops were adapted to all ſorts of enterpriſes. The heavy-armed foot were generally drawn up in the centre of the army, in a ſquare body, called the phalanx. This conſiſted, according to Polybius, of 16 in flank, and 500 in front, all pikemen, the ſoldiers ſtanding ſo cloſe, that the pikes of the fifth rank reached their points beyond the front of the battle. As to the arms of the Macedonians, they were offenſive and defenſive. At firſt their targeteers had only wooden bucklers, or ſuch as were made of a kind of wicker; but in proceſs of time, they had them of leather and braſs. Their ſwords, like thoſe of other Greeks, were made both for puſhing and cutting; and they alſo made uſe of daggers. Their ſpears were both long and ſhort; they had alſo breaſt-plates made of linen quilted to a proper thickneſs, and a particular kind of military ſhoe. When the army was in the field, the phalanx was drawn up generally in the centre. The horſe and light-armed troops in two lines on the right and left. Immediately before battle, the king or general uſually made an oration, of which the ſoldiers expreſſed their approbation by claſhing their arms; but if it did not affect them, they remained ſilent. When they charged, they exclaimed, Alala! Alala! and when they deſired quarter, they held their ſpears aloft in the air. All authors agree in repreſenting the hardineſs, frugality, and good order of the Macedonian troops. Their camp was always fortified with a good ditch and entrenchment. Their tents were ſmall, made of ſkins, and when folded up, they made uſe of them in paſſing rivers. The king's tent was pitched in the centre, and conſiſted of two rooms, one in which he ſlept and the other in which he ſaw company; and before the door of it, his guards did duty. The military ſignals of the Macedonians were either trumpets or fires. On a march the cavalry and light-armed troops took poſt in the van, the phalanx in the centre, and the baggage in the rear, unleſs they apprehended a ſudden engagement; in which caſe they marched in order of battle. Every ſoldier had a kind of knapſack, and the army was attended with a certain number of carts and waggons; but the Macedonians did not allow either women or uſeleſs ſervants to follow the camp. The plunder was ſometimes diſtributed among the ſoldiers, at other times collected and ſold for the uſe of the king, or for the army. In quarters, the army was preſerved from corruption, and its diſcipline maintained by military games, in which rewards, both honorary and lucrative, were beſtowed. After victories, the kings were accuſtomed to reward all who diſtinguiſhed themſelves.

Thoſe who died in the ſervice were honoured with public monuments, and their children and relations were freed from tribute. In all other reſpects, they were treated with the greateſt humanity and condeſcenſion; and when the time limited for their ſervice expired, or their wounds rendered them incapable of ſerving, they were diſmiſſed, with ample proviſion for themſelves and families, that they might enjoy the fruits of their labour, and by living in eaſe and peace, excite younger and more robuſt men to come cheerfully in their room.

The kingdom of Macedon commenced with Caranus in the year 814 B.C. and continued 646 years, till the battle of Pydna.

A Table of the kings of Macedon from its eſtabliſhment to its diſſolution.

B.C.	Kings.
814	Caranus.
786	Cænus.
774	Thurimas.
729	Perdiccas I.
678	Argæus I.
640	Philip I.
602	Æropas.
576	Alectus or Alcetas.
547	Amyntas I.
497	Alexander I.
454	Perdiccas II.
413	Archelaus, ſaid to be the patron of learning.
399	Amyntas II.
398	Pauſanias.
397	Amyntas II.
392	Argæus II. the Tyrant.
390	Amyntas II. reſtored.
371	Alexander II.
370	Ptolemy *Alorites*.
366	Perdiccas III.
360	Philip II. ſon of Amyntas.
336	Alexander III. called the Great.
323	Philip III. *Aridæus*.
316	Caſſander.
298	Antipater.
297	Alexander.
294	Demetrius *Poliocertes*.
287	Pyrrhus.
286	Lyſimachus
280	Ptolemy *Ceraunus*.
279	Meleager.
278	Antipater the *Eteſian*.
277	Antigonus, called *Gonatas*.
243	Demetrius II.
232	Antigonus *Doſon*.
221	Philip V.
179	Perſeus.
168	Perſeus defeated at the battle of Pydna, and taken priſoner by the Romans, which properly finiſhes the kingdom of Macedon.
152	Andriſcus, pretending to be the ſon of Perſeus, aſſumed the tyranny of Macedon, but died in the year 148 B.C.

In the preceding reigns no very intereſting event occurred, till that of Amyntas, to whom Megabyzus, the Perſian general, ſent ſeven of the principal commanders of his army to require him to acknowledge king Darius. Amyntas complied, and gave them a magnificent feaſt. Being intoxicated with wine, they deſired that the women might be produced according to the cuſtom of Perſia. In this particular they were alſo gratified; but as their intoxication increaſed, they began to behave in a brutal manner, and were all ſlain by the contrivance of Alexander, the ſon of Amyntas. Upon this Bubaris was ſent by Megabyzus, with a conſiderable body of troops, to revenge their deaths; but Alexander contrived to pacify Bubaris, by introducing to him Gygæa his ſiſter, who was a very beautiful woman; and who ſo far captivated the officer, that for the ſake of obtaining her for a wife, he adjuſted all things to the ſatisfaction of Amyntas. From this time the kings of Macedon became tributary to the Perſian emperors; but they were always regarded as faithful allies, and treated with kindneſs and reſpect. From this reign the hiſtory of the kings of Macedonia begins to be blended with that of the other powers of Greece. The Macedonian ſovereigns inſenſibly extended their poſſeſſions and authority both to the eaſt and weſt of their country; and the prudence of Perdiccas I. paved the way for the proſperous reign of Philip II., and for the ſucceeding conqueſts of his ſon Alexander. (See the biographical articles of Philip and Alexander *the Great.*) After a reign of about 12 years, the extenſive dominions of Alexander were divided among his generals; Philip Aridæus was recogniſed as his ſucceſſor; but the ambition of the other princes deprived him of a great part of his father's poſſeſſions. His ſucceſſors, after many deſtructive wars with the princes who reigned in Aſia, terminated their career by a war with the Romans, which proved diſaſtrous to them; ſo that Perſeus, after his defeat, was carried captive to Rome; and in a ſhort time Macedonia became a part of the Roman empire. See the next article.

Macedonia *Salutaris*. When Paulus Æmilius had finiſhed the conqueſt of Macedonia, by his victory over Perſeus its laſt king, he divided this kingdom into four diſtinct regions, which became ſubject to different ſorts of government, ſometimes at the will of the emperor, and at other times under the authority of the ſenate. At length, after the reign of Conſtantine, Macedonia became ſubject to the government of the prætorian prefect of the Eaſtern Illyria, and was divided into two provinces. The ſecond of theſe provinces was named *Salutaris*, on account of its mineral waters; it extended itſelf to the upper part of Macedonia, in the vicinity of the mountains which ſeparated this province from Mœſia Superior or Dardania. It was under the metropolis of Sobi, and compriſed eight towns. Pliny.

Macedonia, in *Modern Geography*, a province of European Turkey, bounded on the N. by Servia, on the E. by Romania, on the S. by Theſſaly and the Archipelago, and on the W. by Albania. Its figure is irregular; its ſituation advantageous; and the air clear, ſharp, and ſalubrious. The ſoil is, in general, fertile; and the maritime coaſts particularly abound with corn, wine, and oil. In the inland parts are ſeveral uninhabited waſtes. It had formerly mines and plenty of timber. Its numerous fine bays render it convenient for trade. Its capital is Salonichi. See the article Macedonia.

MACEDONIAN Kingdom, in *Ancient Hiſtory*, one of the four kingdoms into which the empire of Alexander was divided after his death. This kingdom, under Perſeus, who was overcome and taken by Æmilius, and carried in triumph to Rome, where he died in priſon, was reduced to the form of a Roman province. The other three, *viz.* the Aſiatic, Syrian, and Egyptian kingdoms, flouriſhed for a conſiderable time under their own kings, but were at laſt compelled to receive the Roman yoke.

Macedonian *Parſley*, in *Gardening*. See Bubon.

Macedonian *Year.* See Year.

MACEDONIANS, in *Eccleſiaſtical Hiſtory*, the followers of Macedonius, biſhop of Conſtantinople, who, through the influence of the Eunomians, was depoſed by the council of Conſtantinople in 360, and ſent into exile. He conſidered the Holy Ghoſt as a divine energy diffuſed throughout the univerſe, and not as a perſon diſtinct from the Father and the Son. The ſect of Macedonians was cruſhed before it had arrived at its full maturity, by the council aſſembled by Theodoſius in 381, at Conſtantinople. See Semi-arians.

MACEIRA, or Midjare, in *Geography*, an iſland in the Arabian ſea, near the coaſt, about 50 miles long, and from three to eight broad. It is barren and uninhabited, and on the N.W. coaſt are dangerous ſhoals, extending 90 miles along the ſhore, and far into the ſea, ſo that the land cannot be ſeen till the unſkilful pilot touches the rocks. N. lat. 20° 48'. E. long. 57° 35'.

Maceira, *Little*, an iſland in the Arabian ſea, 16 miles long and three broad; 10 miles W. of Maceira.

MACER, Æmilius, in *Biography*, a Roman poet, who flouriſhed in the age and reign of Auguſtus, and is mentioned as a writer in natural hiſtory. His works are referred to by Ovid, particularly a poem on the events of the Trojan war, after the period at which Homer concludes. A poem, "De Herbarum Virtutibus," extant under the name of Macer, is now given up as ſuppoſititious.

Macer, in *Geography*, a river of Africa, in the country of Tripoli, which runs into the Mediterranean.

Macer, in the *Materia Medica*. The Grecian macer is brought from Barbary; and the part in uſe is the thick yellow bark, which has a very aſtringent taſte, and is ſaid by Dioſcorides to be good againſt ſpitting of blood, the dyſentery, and fluxes. See Simarouba.

MACERATA, in *Geography*, a town of Naples, in Lavora; about three miles from Capua.—Alſo, a town in the marquiſate of Ancona, on the Chienta, the ſee of a biſhop, ſuffragan of Fermo; containing ſeveral churches, 13 convents, an univerſity, two academies, and about 10,000 inhabitants; 20 miles S. of Ancona. N. lat. 43° 15'. E. long. 13 31'.—Alſo, a town in the duchy of Urbino; 10 miles N.W. of Urbino. N. lat. 43° 48'. E. long. 12 35'.

MACERATION, in *Pharmacy*, the operation of diſſolving a ſolid body by means of water, or ſome other liquor.

In this ſenſe, the word amounts to much the ſame with liquefaction, or liquation.

Maceration is alſo uſed for the infuſing of a body in any menſtruous fluid, or in order to a ſolution of its principles, whether with or without fire.

In which ſenſe maceration amounts to much the ſame with digeſtion.

Others reſtrain maceration to that particular kind of digeſtion which is performed in thick ſubſtances, as when having mixed roſes with fat to make *unguent. roſatum*, the mixture is expoſed for ſome days to the ſun, that the virtue of the roſes may be the better communicated to the fat.

MACHA Mona, a kind of African calabaſh. It is the fruit of a very large tree which grows in Africa, and the American iſlands. When this fruit is ripe, the pulp has a ſouriſh taſte, with a little aſtringency: it is delicious in hot countries; and they prepare a liquor of it, which they uſe inſtead of lemonade, to cool and refreſh themſelves, and give it to ſick perſons under a looſeneſs. The pulp, dried, taſtes as well as the ſpiced bread of Rheims. The ſlaves make a kind of thick gruel with this pulp and water; it is of an abſorbent quality. The African women uſe the pulp inſtead of rennet, for curdling their milk.

The ſeeds of this fruit are as big as ſmall pine-apple kernels, kidney-ſhaped, of a cheſnut-colour, and encloſing an almond far more delicious than our ſweet almonds.

MACHACA, in *Geography*, a town of Peru, in the dioceſe of La Paz; 80 miles S.W. of La Paz. S. lat. 17° 40'. W. long. 69° 14'.

MACHÆRINA, in *Botany*, Vahl. Enum. v. 2. 238. See Schoenus.

MACHÆRION, a word uſed by chirurgical writers, as the name of an inſtrument of the nature of the inciſion knife. It is alſo ſometimes uſed to expreſs an inciſion; and by the aruſpices of old it was applied to ſome particular part of the liver of animals, from which they preſaged events.

MACHÆRUS, or Macheronte, in *Ancient Geography*, a city and fort beyond Jordan, in the tribe of Reuben, N. and E. of the lake Aſphaltites, two or three leagues from Jordan, and not far from its mouth in the Dead ſea. This caſtle had been fortified by the Aſmoneans. Gabinius demoliſhed it, and Ariſtobulus fortified it anew; and Herod the Great made great additions to its ſtrength. At or near it was a ſpring of very ſalutary hot waters. John the Baptiſt was put in priſon, and beheaded at Machærus, by the order of Herod Antipas. Joſephus Ant.

MACHALA, in *Geography*, a town of South America, in the audience of Quito, and juriſdiction of Guayaquil; annexed to the lieutenancy of Puna. It lies on the coaſt of Tumbez, together with that of Naranjol, the landing-place of the river of the ſame name, called alſo the Suya, near which is a road leading to the juriſdictions of Cuenca and Alauſi. The juriſdictions of Machala and Manaranjol produce great quantities of cacao, and that of the former is eſteemed the beſt in Guayaquil. In its neighbourhood, as well as in the iſland of Puna, are great numbers of mangrove-trees; in the wood of which the Indians pay their annual tribute. This wood is uſed in ſhips, &c. and is very durable, as it is ſubject neither to ſplit nor rot: 55 miles N.N.W. of Loxa. S. lat. 3° 15'. W. long. 79°.

MACHAON, in *Biography*, an illuſtrious hero and phyſician, who, with his brother Podalirius, accompanied the Grecian army in the expedition againſt Troy, and performed great ſervices among the troops. Theſe two perſons were deemed the ſons of Eſculapius; and Machaon appears to have been the elder brother, according to the poet Quintus Calaber, who introduces Podalirius as ſaying, on the occaſion of his death, that "his dear brother had brought him up like a ſon, after their father was taken into heaven, and had taught him to cure diſeaſes." (Lib. vii. v. 60.) Homer, indeed, mentions Podalirius firſt, when he names both together; but that ſeems to have ariſen only from the convenience of the verſe. Ποδαλείριος ἠδὲ Μαχάων. For Machaon appears to have been moſt highly eſteemed by the great officers of the army. It was he who adminiſtered to Menelaus, when wounded by Tindarus, firſt wiping the blood from the wound, and then applying emollient remedies, after the manner of his father. It was Machaon, alſo, who cured the lameneſs of Philoctetes, occaſioned by dropping an arrow, dipped in the gall of the Lernean Hydra, bequeathed him by

Hercules, on his foot. "Tarda Philoctetæ ſanavit crura Machaon." Prop. lib. ii.

It appears, too, from the writings of the poets, that Machaon was a brave and active ſoldier; for he is mentioned as engaged in ſome of the moſt dangerous enterpriſes, with the other celebrated leaders. Homer tells of a wound which he received in the ſhoulder, in one of the ſallies of the Trojans; and Virgil and Hyginus inform us, that he was one of the brave warriors who entered the wooden horſe, from which, according to the former, he was the firſt to deſcend. (Æneid. lib. ii. v. 263. Hygin. Fabul. lib. i. cap. 81. &c.) He is ſaid to have loſt his life in ſingle combat with Nereus, or, as others ſtate, with Eurypilus, the ſon of Telephus, during the ſiege of Troy; which, however, is inconſiſtent with the aſſertion juſt mentioned, ſince the ſiege was terminated by the introduction of the troops in the wooden horſe. (See Pauſanias in Laconic. 2. Calaber, lib. vi. & vii.) Pauſanias adds, that the remains of Machaon were preſerved by Neſtor, and conveyed to Meſſenia, where they were buried.

Machaon married Anticlea, daughter of Diocles, king of Meſſenia, by whom he had two ſons, Nichomachus and Gorgaſus, who reſided at Pheræ, and poſſeſſed the territory of their grandfather, until the Heraclidæ, on their return from Troy, made themſelves maſters of Meſſenia, and the reſt of the Peloponneſus. Machaon is ſuppoſed to have been a king, either in his own right, or that of his wife, ſince Homer, in two or three places, calls him "Paſtor of the people," (ποιμένα λαῶν), a title which he gives to Agamemnon and the other kings. Pauſanias mentions three other ſons of Machaon, namely, Sphyrus, Alexanor, and Polemocrates, who are ſuppoſed to have been the fruit of another marriage. M. Goulin, in his literary and critical memoirs, ſtates his opinion, that the birth of Machaon may be fixed about the year of the world 2765. See Le Clerc. Hiſt. de la Médecine. Schultzius Hiſt. Medicinæ.

MACHAU, Guillaume, a French poet and muſician, born about 1282. He was at firſt in the ſervice of the conſort of Philippe-le-Bel, and, in 1307, was appointed valet-de-chambre to the king, and continued to occupy this office to the end of that prince's reign, who died in 1314.

As the works of this author are the moſt ancient lyric compoſitions that have been preſerved in France, with the original muſic, great pains have been taken in commenting them, and rendering both words and muſic intelligible.

The abbé Lebœuf, in the year 1746, gave a very ample and ſatisfactory account to the Academy of Inſcriptions at Paris of two volumes of French and Latin poems, preſerved in the library of the Carmelites of that city, "with a deſcription of the kind of muſic to which ſome of theſe poems were ſet."

In 1747, the count de Caylus, having found in the king of France's library, N° 7609—2, a duplicate of theſe poems, gave likewiſe an account of them to the ſame Academy, in two memoirs. The author, Guillaume de Machau, is ſtyled by the count, *poet and muſician;* and both theſe excellent critics agree, that he flouriſhed about the middle of the fourteenth century, and died in 1370. Among the poems, which are written upon various ſubjects, there is an infinite number of lais, virelais, ballads, and rondeaux, chiefly in old French, with a few in Latin, and ſet to muſic: ſome for a ſingle voice, and others in four parts, triplum, tenor, contratenor, and a fourth part, without a name. In theſe full pieces, as the words are placed only under the *tenor part*, it is natural to conclude that this was the principal melody. In the muſic, which is written with great care and neatneſs, notes in a lozenge form, with *tails* to them, frequently occur; theſe, whether the heads were *full* or *open*, were at firſt called *minims;* but when a ſtill quicker note was thought neceſſary, the white or open notes only had that title, and the black were by the French called *noir*, and by Engliſh *crotchets:* a name give by the French with more propriety, from the hook or curvature of the tail, to the ſtill more rapid note, which we call a *quaver*.

The Latin poems are chiefly motets, and for a ſingle voice; ſome of which are written in black and red notes, with this inſtruction to the ſingers: "nigræ ſunt perfectæ, & rubræ imperfectæ." An admonition worth remembering by thoſe who wiſh to decipher muſic of the fourteenth and fifteenth centuries, in which red notes frequently occur. It was an eaſy expedient of diminution, till the invention of printing, when the uſe of ink of different colours, on the ſame page, occaſioned the expence and trouble of *double printing*. The abbé Lebœuf obſerves, that the diſſection and accelerated motion of notes, during theſe ages, gave great offence and ſcandal to pious and ſober Chriſtians. In a kyrie eleiſon to the Gregorian chant, which is called *tenor*, the three parts that are added to it are called triplum, motetus, and contratenor. In the ſecond volume of theſe poems the common chants of the whole maſs, and even the credo, are written in four parts. This maſs is ſuppoſed to have been ſung at the coronation of Charles V. king of France, 1364.

There are in the French MS. many ballads and rondeaux in three parts, tenor, triplum, and contratenor. The fourteenth century ſeems the era when muſic in parts, moving in different melodies, came firſt into general favour; for of the preceding age no muſic can be found of more than two parts in ſtrict counterpoint of note againſt note.

Machau calls his collection of ſongs ſet to muſic, *Remedes de fortune*, regarding muſic as a ſpecific, or at leaſt an opiate, againſt the ills of life. In the illuminations to theſe lyric compoſitions an aſſembly of minſtrels is repreſented with thirty or forty muſical inſtruments, of which he gives the names. His poem called "Le Dit de la Harpe," is a moral and allegorical piece in the ſtyle of the famous "Roman de la Roſe," by Guillaume de Loris, and Jean de Meun.

The abbé Rive has likewiſe given an hiſtorical and critical account of another MS. copy of thoſe poems in the collection of the duke de le Valliere; but none of theſe gentlemen have produced ſpecimens of Machau's muſical compoſitions; indeed the count de Caylus frankly confeſſes, that though he has ſtudied this muſic with the utmoſt attention, and conſulted the moſt learned muſicians, he has been utterly unable to ſatisfy his curioſity concerning their intrinſic worth.

Machau, in *Geography*, a town of Bohemia, in the circle of Konigingratz; eight miles S.W. of Branaw.

MACHAVANA, a river of Africa, which runs into the Indian ſea, S. lat. 26° 45′.

MACHAULT, James de, in *Biography*, a French Jeſuit, was a native of Paris, and born in 1599. He entered on his noviciate in his eighteenth year, and after having finiſhed the uſual courſe of academic ſtudies, he was ſelected to teach, firſt polite literature, then philoſophy, and for ſeveral years divinity, in different ſeminaries belonging to the order. He was elected ſucceſſively rector of the colleges at Alençon, Orleans, and Caen, and died in his native city in 1680. He was author of many conſiderable works, as "The Account of the Miſſions in Paraguay and other Parts of South America," 8vo. 1636; "A Relation of the State of Affairs in Japan," 1646; "Account of the Provinces of Goa," &c.; "A Relation of the Travels of twenty-five Members of the Society on the Indian Miſſion," 1659; "Account of the Miſſion of the Society in Perſia," &c.

Machault, in *Geography*, a town of France, in the department of the Ardennes, and chief place of a canton, in the diſtrict of Vouziers; nine miles S.W. of Vouziers. The place contains 693, and the canton 4000 inhabitants, on a territory of 242½ kiliometres, in 14 communes.

MACHECOUL, a town of France, in the department of the Lower Loire, and chief place of a canton, in the diſtrict of Nantes; 18 miles S.W. of Nantes. The place contains 1899, and the canton 5152 inhabitants, on a territory of 155 kiliometres, in ſix communes. N. lat. 47°. W. long. 1° 44′.

MACHERA Lapis, in *Natural Hiſtory*, the name of a ſtone of a ferruginous colour, frequent on mount Berecynthus in Phrygia. Plutarch, and many other grave writers, relate, that if any perſon found this ſtone, and took it up at the time of the celebration of Cybele, he inſtantly was ſeized with madneſs.

MACHERIA, in *Geography*, a town of Hindooſtan, in Palnaud; ſix mile S.W. of Timerycotta. N. lat. 27° 35′. E. long. 77° 15′.

MACHERN, a town of Pruſſia, in Natangen; 25 miles S. of Raſtenburg.

MACHERRY, a town of Hindooſtan, in the country of Mewat; 70 miles S.S.W. of Delhi.

MACHESIN, or Machisin, a town of Aſiatic Turkey, in the province of Diarbekir; 105 miles S.E. of Raca.

MACHIA, a town of Naples, in the country of Moliſe; 12 miles S.W. of Moliſe.—Alſo, a town of Naples, in the Capitanata; 10 miles N.N.W. of Volturara.—Alſo, a town of Naples, in Calabria Citra; five miles N. of Biſignano.—Alſo, a town of Naples, in Principato Citra, on the coaſt; 15 miles S. of Capaccio.

MACHIAN, one of the Molucca iſlands, near the W. coaſt of Gilolo; about 18 miles in circumference, and populous. The Dutch have three forts garriſoned with ſoldiers. Its principal articles of commerce are cloves and ſago: a little N. of the line. E. long. 127° 21′.

MACHIANA, an iſland at the mouth of the river of the Amazons, about 15 miles long and three broad; a little S. of the line. W. long. 57° 2′.

MACHIAS, a port of entry, poſt-town, and ſeat of juſtice in Waſhington county, and ſtate of Maine, America, ſituated on a bay of the ſame name; 20 miles S.W. of Paſſamaquoddy, in N. lat. 47° 37′. This town carries on a conſiderable trade to Boſton and the Weſt Indies, in fiſh, lumber, &c. It was permanently ſettled in 1763, and incorporated in 1784. The chief ſettlements are at the E. and W. Falls, and at Middle river. At W. Falls, there is a gaol, and the county courts are held there. The entrance of Machias river is in N. lat. 44° 35′. W. long 66° 56′. The town is divided into four diſtricts for the ſupport of ſchools, and into two for the convenience of public worſhip. In 1792 Waſhington academy was eſtabliſhed here, which has for its ſupport a townſhip of land. In 1800 the town contained 1014 inhabitants. The exports conſiſt principally of lumber, *viz.* boards, ſhingles, clap-boards, laths, and various kinds of hewed timber. The cod-fiſhery, which might be proſecuted to advantage, has been neglected. The ſaw-mills are 17 in number, and much employed. The total amount of exports annually exceeds 15,000 dollars. From Machias bay to the mouth of St. Croix there are many fine iſlands. Morſe.

MACHIAVELISM, in *Literary Hiſtory*, is a ſpecies of deteſtable politics, which may be defined in few words, the art of reigning tyrannically, the principles of which are inculcated in the works of Machiavel, a native of Florence, and particularly in his treatiſe, entitled "The Prince." M. de Wicquefort obſerves, concerning the character of this writer: Machiavel ſays almoſt every where what princes do, and not what they ought to do. To the ſame purpoſe the chancellor Bacon remarks: "Eſt quod gratias agamus Macchiavello et hujus modi ſcriptoribus qui aperte & indiſſimulanter proferunt quid homines facere ſoleant non quid debeant." Machiavel was ſecretary, and afterwards hiſtoriographer to the republic at Florence. He was put to the rack upon the ſuſpicion of being concerned in a confederacy againſt the houſe of Medicis; but he endured the torments of it, without making any confeſſion. He was as much an enemy to religion as to ſound politics; and is ſaid to have died in the year 1530, uttering profane jeſts and blaſphemies. Bayle. See Macchiavelli.

MACHIAWARA, in *Geography*, a town of Hindooſtan, in the circar of Sirhind; 28 miles N. of Sirhind.

MACHICOLATION, from *meche*, a match or wick to preſerve fire, and *couler*, to flow, in *Fortification*, perpendicular apertures in the upper part of the gate of an ancient caſtle, for the purpoſe of pouring down various burning ſubſtances on the aſſailants, when they were battering them, or otherwiſe trying to force them open. In various ancient charters, permiſſion was granted to the owners of caſtles, *embattelandi*, *kernellandi*, and *machicolandi*.

MACHICORA, in *Geography*, a river of Madagaſcar, which gives name to a province, and runs into the ſea on the S. coaſt. S. lat. 25° 3′. E. long. 41° 12′.

MACHIGASTA, a town of South America, in the province of Tucuman; 50 miles W.S.W. of St. Fernand.

MACHINE, in a general ſenſe, ſignifies any thing that is uſed to augment or to regulate moving forces or powers; or, it is any inſtrument employed to produce motion, ſo as to ſave either time or force. The word is derived from *μηχανη*, *machine*, *invention*, *art*; and is therefore properly applied to any agent in which theſe are combined, whatever may be the ſtrength or ſolidity of the materials of which it is compoſed. The term machine, however, is by common uſage generally reſtricted to a certain claſs of agents, which ſeem to hold a middle place between the moſt ſimple *organa*, commonly called tools or inſtruments, and the more complicated and powerful, termed *engines*. This diſtinction, however, does not enter into the preſent article; we ſhall conſider machines under two heads, *ſimple* and *compound*. To the firſt claſs belong the *lever*, the *inclined plane*, the *ſcrew*, the *wedge*, the *wheel* and *axle*, and the *pulley*, commonly called the ſix mechanical powers; though ſome authors will only allow the lever, and the inclined plane, to be ſimple machines, the others being compounded of thoſe two.

Compound machines are all ſuch as conſiſt of a combination of the ſeveral ſimple machines or mechanical powers above-mentioned, the number of which in the preſent advanced ſtate of the ſciences is almoſt infinite. Theſe are again claſſed under different denominations, according to the agents by which they are put in motion, the purpoſes they are intended to effect, or the art in which they are employed, as hydraulic, pneumatic, military, architectural, &c. machines. The ancients excelled in the two latter ſpecies of engines, but in thoſe which relate to civil arts and manufactory, the moderns have doubtleſs far exceeded their maſters. With regard to military machines, the invention of gunpowder has completely changed their nature, and all thoſe of the ancients are become uſeleſs and forgotten; theſe were principally of three diſtinct ſpecies, *viz.* thoſe employed for throwing deſtructive weapons; as the *ſcorpion*, which was for caſting arrows; the *catapulta* for ſtones and javelins; the *pyrobole* for flaming darts; the *balliſta* for bullets, &c. &c.

Others were for razing the walls of fortified places, of which the principal was the *aries*, or *battering ram*; and thoſe of the third kind were for covering the approaches of the beſiegers, as the wooden tower, &c.; for a deſcription of which ſee the reſpective articles. The warlike machines employed by Archimedes in the defence of Syracuſe have been much applauded by the ancients, and though many of the circumſtances related on this head are doubtleſs falſe or exaggerated, yet it is ſufficient to know the genius of their author to be convinced that they were powerful and effective, probably much exceeding any of thoſe of which the conſtruction has been aſcertained.

Of the architectural machines of the ancients we are totally unacquainted, and one is at a loſs to conceive what means they employed for tranſporting and raiſing thoſe enormous ſtones which are found in the walls of ſome ancient buildings, though it is not unlikely that they owed as much to their patient perſeverance and manual labour, as to the power of their machines. The Spaniards, when they made the conqueſt of Peru, were ſtruck with aſtoniſhment to find the natives, whom they conſidered as ſavages and barbarians, raiſing enormous maſſes of ſtone of ten feet ſquare for building walls and other purpoſes, without the aſſiſtance of any inſtruments than thoſe which nature had ſupplied them with: unacquainted with any other ſcaffolding but that of banks of earth raiſed againſt their buildings, they contrived by ſtrength of hand to raiſe theſe maſſy loads up the inclined planes thus formed; and many of the Druidical remains in this country were probably erected in a ſimilar manner. The ancient Greek and Roman architects, however, were no doubt acquainted with, and employed very powerful machines in the conſtruction of their noble edifices, with the nature of which we have not been informed; even Vitruvius, who writes expreſsly on the ſubject, has left us nothing that can throw any light on the conſtruction of theſe engines, yet that they were in poſſeſſion of immenſe and wonderful machinery, appears in the moſt convincing manner to any perſon who reflects on the magnificent ſtructures which they erected, and which excite to this day the wonder and admiration of the world, not only on account of their grandeur and incomparable elegance, but alſo on account of the mechanical knowledge that ſeems indiſpenſably neceſſary for their erection.

The hydraulic machines of the ancients were indeed much inferior to thoſe of modern invention. The *ſcrew* of Archimedes, and the *pumps* of Cteſibius, were the principal engines of this deſcription; for which ſee the reſpective articles. As to the modern machines they are too numerous to admit even of a ſlight enumeration in this place; moſt of them, however, of any importance, will be found under the ſeveral heads in this work. See Cranes, *Wind* and *Water* Mills, Steam *Engine*, &c. &c.

Montucla, at the concluſion of the third volume of his "Hiſtoire des Mathematiques," has given a catalogue of ſeveral intereſting works, which have been compiled in order to deſcribe and exhibit the moſt important and curious machines, both ancient and modern, of which we have ſelected a few for the information of thoſe who may not poſſeſs the above-mentioned work.

1. The firſt and moſt intereſting modern work of this deſcription is entitled "Le diverſe et artificioſe machine del capitano Agoſtino Ramelli dal ponte della Treſia, &c. &c. compoſte in lingua Italiana et Franceſe; a Parigi 1588," in folio, (in Germany,) in 1620. This is a very ſcarce work, ſeldom to be met with but in choice libraries.

2. "Machinæ novæ Fauſti Verantii cum declaratione, Latina, Italica, Hiſpanica, Gallica, et Germanica," Venetiis 1591, 1625, in folio, with figures.

3. "Récueil de pluſieurs Machines militaires, &c. pour la Guerre et Récreations," par François Thypourel et Jean Appus, 1620, 4to.

4. "Heinrich Zeizings, Theatrum machinarum," Leipſic 1621.

5. "A Century of Inventions, &c." by Edward Somerſet, marquis of Worceſter, London 1663, in 12mo.

6. "Les dix Livres d'Architecture de Vitruve, &c." tranſlated into French by Claude Perrault, 1673, folio.

7. "Veterum mathematicorum, Athenaci, Apollodori, &c." 1693, folio. This learned and curious edition of the ancient Greek machinicians was begun by Thevenot, and finiſhed by La Hire; but it relates principally to military engines.

8. "Theatrum machinarum univerſale, &c." by Jacob Leupold, Leipſic, ſeven volumes folio, 1724, 1727, 1774. This is the greateſt and moſt complete work of the kind that ever was publiſhed. The firſt volume is little more than an introduction to the work; the ſecond and third volumes contain deſcriptions of hydraulic machines; the next two volumes relate to machines for raiſing weights, the theory of levelling, and other ſubjects; and the ſixth treats principally on machines connected with the conſtruction of bridges; the ſeventh volume is entitled "Théatre arithmetico geometrique," where the author treats of all inſtruments employed in theſe two ſciences. This work would have been much more conſiderable, if its author had lived to complete the immenſe taſk he had undertaken.

9. "A ſhort Account of the Methods made uſe of in laying of the Foundation of the Piers of Weſtminſter Bridge," by Charles Labelye, 1739.

10. "The Advancement of Arts, Manufactures, and Commerce; or, A Deſcription of uſeful Machines and Models," by A. M. Bailly, London 1778, 1779, folio.

Beſides the above-mentioned works, many uſeful particulars may be gathered from Strada, Beſſon, Beroaldus, Bockles, Beyer, Lempergh, Van Zyl, Belidor's Architecture hydraulique, Deſaguliers's Courſe of experimental Philoſophy, Emerſon's Mechanics. The Royal Academy of Sciences at Paris have alſo given a collection of machines and inventions approved of by them. This work, publiſhed by M. Gallon, conſiſts of ſix volumes in quarto, containing engraved repreſentations of the machines, with their deſcriptions annexed.

We might have carried the enumeration of works of this kind to a much greater length, but the above are the moſt intereſting, and the reader who wiſhes for farther information on this ſubject may conſult the hiſtory of Montucla abovementioned. But we ought not to omit to mention in this place, the ſecond volume of the "Architecture Hydraulique" of Prony, and the ſecond volume of Gregory's Mechanics: the firſt of theſe relates principally to ſteam engines, but the latter contains a deſcription of the moſt uſeful modern machines for various purpoſes.

In the conſtruction of machinery, as alſo in eſtimating its effects, ſeveral important conſiderations naturally ariſe in the mind of a ſkilful artiſt, ſuch as the effect of Friction, Rigidity of *ropes*, the Strength and Stress of materials; the proper meaſure, compariſon, and equilibrium of Forces, the laws of Rotatory and Accelerated *motion*, &c. &c. Theſe are all treated of under the reſpective articles in the Cyclopædia, and it therefore only remains for us in this place to offer a few remarks on the nature of machines in general, and the beſt means of determining their maximum effects.

Machines are introduced for three purpoſes, *viz.* to accommodate the direction of the moving force to that of the reſiſtance to be overcome; to increaſe the effect of a given finite power, ſo as to overcome a reſiſtance which is greater, and would otherwiſe ever remain unchanged: and laſtly, to regulate and modify a variable force, ſo as to produce a conſtant and uniform effect. Theſe are the principal ends to be accompliſhed by machines, and the experienced engineer will always endeavour to execute them in the ſimpleſt manner poſſible; for complicated machinery is not only moſt liable to inaccurate adjuſtment, and frequent diſarrangement, but is likewiſe more cumberſome and expenſive, at the ſame time that the retardation ariſing from friction, adheſion, and inertia, is more conſiderable, and conſequently a greater power becomes neceſſary, in order to produce the ſame effect. Another important point to be attended to, is the moſt advantageous application of the firſt mover, whether this agent be air, water, ſteam, or animal ſtrength. To enter upon this queſtion in all its generality, would far exceed our limits; beſides, with regard to the three former, they will be better inveſtigated under the articles *Wind* and *Water* MILLS, STEAM *Engine*, &c.; what few remarks, therefore, we have to make on this head, will be confined to the application of animal exertion to the motion of machines, and for the other agents we muſt refer the reader to the articles above-mentioned.

We have a ſtriking inſtance of the injudicious application of the exertion of men, in the old crane worked by means of an internal walking wheel, which, from its nature, muſt be very heavy, while the action of the man is exerted at a very trifling diſtance from the axle, and conſequently at a great mechanical diſadvantage; whereas in Hardie's crane, the man acting externally at the greateſt diſtance from the fulcrum, produces a much greater effect with leſs expence of labour; the other advantages which this machine poſſeſſes over the one above-mentioned, not ariſing ſolely from this cauſe, are not connected with our preſent enquiry.

The above remark applies principally to the mechanical advantage to be obtained in the application of a firſt mover; but there is alſo another conſideration of a phyſical nature, which is equally important, and ought therefore to be particularly attended to. No animal can exert more than a determinate and limited force; and, conſequently, if it requires all this force merely to produce an equilibrium, no effect will reſult from the action: and, on the other hand, if all the ſtrength of a man or horſe is employed in giving motion to himſelf, or to external objects before the application reaches the reſiſtance, there is ſtill the ſame unproductive effect. A man, for example, puſhing at a capſtan bar, muſt firſt of all walk as faſt as the bar moves round, which evidently requires an expenditure of his muſcular power; but this alone will not render his exertion effective: he muſt alſo preſs the bar forward, with as much force as he has remaining above that which he expended in walking at that rate. The proportion of theſe two expenditures may be very different under different circumſtances; and on the judicious ſelection of ſuch circumſtances as make the firſt of theſe as ſmall as poſſible, lies much of the ſkill of the engineer. In the common operation of thraſhing corn, much more than half the man's power is expended in giving the neceſſary motion to his own body; and only the remainder is employed in urging forward the ſwiple with a momentum ſufficient for ſhaking out the ripe grains from the ſtalk. Dr. Robiſon mentions an experiment, made in order to aſcertain the quantity of power thus loſt. In order to which, the ſwiple was taken off the flail, and the ſame weight of lead put on the end of the ſtaff; then by cauſing the labourer to perform the uſual motions of thraſhing, with all the rapidity that he could continue during the ordinary hours of work; it was found that the number of motions thus made was to thoſe made in the actual operation of thraſhing, in about the ratio of 3 to 2: whence we may infer, that at leaſt half the thraſher's power is expended in merely moving his own body. We may alſo bring another very ſimple caſe, by way of further illuſtration. Suppoſe a quantity of earth is to be removed from one place to another by barrows. It is obvious that the loads may be ſo great, that a man muſt exert his whole ſtrength barely to lift up the ſhafts, and conſequently will have none left to puſh the barrow forward: if part of the load be taken off, he can go forward, and ſo much the faſter as the quantity of the load is reduced; but if even the whole be taken away, he can ſtill only move at a certain rate, and, conſequently, in neither of the extreme caſes is any effect produced. It becomes then an intereſting queſtion to determine what load he ought to carry, in order to produce the greateſt poſſible effect in a given time. We ſhall not, in this place, enter any farther upon this ſubject, truſting that what has been already advanced will be ſufficient to point out the neceſſity of attending to ſuch circumſtances; and in the ſubſequent part of the preſent article, we will endeavour to explain in what manner the proper adjuſtment of power and effect may be computed.

The nature of the firſt movement being determined, the next object is to communicate it to the deſtined point, where the reſiſtance is to be overcome; and much of an artiſt's ſkill depends upon performing this in the ſimpleſt and moſt effectual manner poſſible. In order to this, it frequently becomes neceſſary to convert one ſpecies of motion into another ſpecies: as, for example, a rotatory into a reciprocating motion, or a reciprocating into a rotatory motion, &c. &c. The methods of forming this communication are extremely numerous, and it will not therefore be expected that we ſhould attempt an enumeration of them. In ſome inſtances, a ſimple lever or unbent cord will anſwer better than any combination; in others, it is highly advantageous to uſe a combination of levers acting upon each other by means of ſo many fulcra, and by which the direction of the motion may be changed at pleaſure; in others, as when motion is communicated to a ſeries of wheels and axles in ſucceſſion, it may be effected by a rope running in grooves round one wheel and the ſucceeding axle, or by means of tooth and pinion work, by a barrel and endleſs ſcrew, and various other contrivances which will naturally ſuggeſt themſelves, according to the circumſtances under which they ariſe.

This part of the conſtruction being ſettled, other important circumſtances require particular attention, *viz.* to adjuſt the ſeveral parts of the machine ſo, that its motion may be eaſy, free, and uniform. One of the moſt obvious methods of rendering a motion uniform is by means of a *pendulum* and *ſcapement* (ſee theſe two articles); and where theſe cannot conveniently apply, a fly is ſometimes employed; for a particular deſcription of which, ſee FLY. The uniformity of a machine is not, however, wholly dependent upon the application of ſuch regulators: there are other points connected with this ſubject, that muſt not be overlooked, and on which we intend to offer a few remarks; availing ourſelves, for this purpoſe, of the obſervations of Dr. Robiſon. When heavy ſtampers are to be raiſed, in order to drop on the matters to be pounded, the wipers by which they are lifted ſhould be made of ſuch a form, that the ſtamper may be raiſed by a uniform preſſure, or with a motion almoſt perfectly uniform: if this is not attended to, and the wiper is merely a pin ſticking out from the axis, the ſtamper is forced into action at once, which occaſions violent jolts to the machine, and great ſtrains on its moving parts, and their points of ſupport; whereas, when they are gradually lifted, the inequality of the motion is never felt at that point of the machine where the power is applied. We have ſeen, ſays the profeſſor, piſtons moved by means of a double rack on the piſton rod, where a half wheel takes hold of one rack, and raiſes it to the required height; and the moment the half wheel has quitted that ſide of the rack, it lays hold of the other ſide, and forces the piſton down again. This was conſidered as an improvement of the common method of the crank, by correcting the unequable motion of the piſton. But in fact it is far inferior to the latter, as it occaſions ſuch abrupt changes of motion, that the machine is ſhaken and torn to pieces with the jolts it occaſions; a circumſtance which will always be avoided as much as poſſible by a judicious engineer.

When ſeveral ſtampers, piſtons, or other reciprocal movers, are to be raiſed and depreſſed, their times of action ought to be diſtributed in a uniform manner, ſo that the machine may always be equally loaded with work. When this is done, and the obſervations in the preceding paragraph attended to, the machine may be made to move almoſt as ſmoothly as if there were no reciprocations on it. Nothing ſhews the ingenuity of the conſtructor more than the artful, yet ſimple, contrivances for obviating thoſe difficulties that unavoidably ariſe from the very nature of the work that muſt be performed by the machine, and of the power employed. We mentioned, above, the converſion of the continued rotation of an axis into the reciprocating motion of a piſton, and the improvement that was thought to have been made in the common and obvious contrivance of the crank, but which, as was obſerved, occaſioned ſuch jolts as would in a ſhort time have deſtroyed the machine. In order to avoid this, in a large forge where a great ſledge hammer of ſeven hundred weight was to be raiſed, the engineer formed the wipers into ſpirals, which communicated motion to the hammer almoſt without any jolt whatever: and under ſome circumſtances, this contrivance would have been highly beneficial; but in the machine to which we allude, it would not apply, as it did not communicate a ſufficient momentum to the hammer in its deſcent: yet it is deſerving of notice, as it might in ſome caſes become extremely advantageous.

In employing a power, which of neceſſity reciprocates, to drive machinery, in which a rotatory motion is required, as in applying the ſteam-engine to a cotton or griſt-mill, conſiderable difficulties alſo ariſe, which muſt be attended to with particular care. The neceſſity of reciprocation on the firſt mover waſtes much power, becauſe the inſtrument that communicates ſuch immenſe force muſt be extremely ſtrong, and well ſupported. The impelling power is waſted in imparting, and afterwards deſtroying, a great quantity of motion in the working beam. The ſkilful engineer will attend to this, and do his utmoſt to procure the neceſſary ſtrength of the firſt mover, without making it a vaſt load of inert matter: he will alſo remark that all the ſtrains on it, and on its ſupports, are changing their direction on every ſtroke; which therefore requires particular attention in the manner of ſupporting it. If we obſerve ſteam-engines that have been long erected, we ſhall find that they have uniformly ſhaken the building to pieces, which is principally to be attributed to the inattention of the engineer to this circumſtance; and experience has now taught us, that no building can long withſtand the deſultory and oppoſite jolts of ſuch immenſe maſſes; and, cenſequently, that the great movements ought to be ſupported by a frame-work, independent of the building which contains it. Another circumſtance, on which the uniformity of the motion depends, is the form given to the teeth of the wheel: this is of great importance, and has excited great attention amongſt both theoretical and practical machinicians. Two forms have been propoſed: of theſe the firſt was given by La Hire, who affirmed that the preſſure would be uniform, if the teeth were formed into epicycloids; and M. Camus, in his "Cours de Mathematique," has adopted and purſued La Hire's principle, and applied it to the various caſes that are likely to ariſe in practice. This conſtruction, however, is liable to a limitation; on which account, a ſecond method has been propoſed, which ſecures the perfect uniformity of motion, without any ſuch limitation. This conſiſts of making both teeth portions of involutes of circles; but as we ſhall conſider this ſubject under the articles TOOTH and PINION *Work*, it will be uſeleſs to inſiſt any farther upon it in this place; and we will therefore proceed to the theoretical inveſtigation of the power of machines, and their maximum effects; limiting our obſervation to thoſe principally whoſe motion is uniform, theſe forming by far the moſt numerous claſs, and the knowledge of which is, therefore, of the greateſt importance.

Of the maximum Effects of Machines.—When forces acting in contrary directions, or in any ſuch directions as produce contrary effects, there is with reſpect to every ſimple machine, and conſequently with reſpect to every compound one, a certain relation between the powers and the diſtances at which they act, which, if ſubſiſting in any ſuch machine when at reſt, will preſerve it in that ſtate of ſtatical equilibrium; becauſe the efforts of theſe powers, when thus related with regard to magnitude and diſtance, being equal and oppoſite, deſtroy each other, and have no tendency to change the ſtate of the ſyſtem to which they are applied. So alſo, if the ſame machine have been put into a ſtate of uniform motion, whether rectilinear or rotatory, by the action of any power diſtinct from thoſe we are now conſidering, and theſe two powers be made to act upon the machine in ſuch motion, in a ſimilar manner to that in which they act upon it when at reſt, their ſimultaneous action will preſerve it in that ſtate of uniform motion, or dynamical equilibrium, and this for the ſame reaſon as before; becauſe their contrary effects deſtroy each other, and have, therefore, no tendency to change the ſtate of the machine. But if at the time a machine is in a ſtate of balanced reſt, any one of the oppoſite forces be increaſed, while it continues to act at the ſame diſtance, this exceſs of force will diſturb the ſtatical equilibrium, and produce motion in the machine; and if the ſame exceſs of force continues to act in the ſame manner, it will, like every conſtant force, produce an accelerated motion; or if it ſhould undergo particular modifications, when the machine is in different poſitions, it may occaſion ſuch variations as will render it alternately accelerated and retarded. Or, the different ſpecies of reſiſtance to which a moving machine is ſubjected, as the rigidity of cords, friction, reſiſtance of the air, &c. may ſo modify it, as to change a regular or irregular variable motion into one which is uniform. Hence, then, the motion of machines may be conſidered as of three kinds, as that which is gradually accelerated, which obtains commonly in the firſt inſtants of the communication. 2. That which is entirely uniform. 3. That which is alternately accelerated and retarded. Pendulum clocks and machines that are moved by a balance are related to the third claſs. Moſt other machines are of the ſecond claſs, at leaſt a ſhort time after their motion is commenced.

Now, although the motion of a machine be alternately accelerated and retarded, it may, notwithſtanding, be meaſured

ſured by an uniform motion, in conſequence of the periodical and regular repetition which may exiſt in the acceleration and retardation. Thus, the motion of a ſecond pendulum, conſidered in relation to a ſingle oſcillation, is accelerated during the firſt half ſecond, and retarded during the ſecond; but the ſame motion taken for many oſcillations may be conſidered as uniform. Suppoſe, for example, that the extent of each oſcillation is five inches, and that the pendulum has made ten oſcillations; its total effect will be to have run over 50 inches in 10 ſeconds, and as the ſpace deſcribed in each ſecond is the ſame, we may compare the effects to a moveable, which moves for 10 ſeconds at the rate of five inches *per* ſecond. We ſee, therefore, that the theory of machines, whoſe motions are uniform, conduces naturally to the eſtimation of the effects of thoſe whoſe motion is alternately accelerated and retarded, ſo that what follows will be directed to thoſe machines only, whoſe motion falls under the ſecond head, ſuch problems being of far the greateſt utility in practice.

We have had already frequent occaſion to make uſe of the terms *mover*, or *moving force* and *reſiſtance;* and in what follows, they will be uſed in the ſame general ſenſe. By the firſt is always to be underſtood any cauſe of motion whatever, and by the latter, any thing that is oppoſed to the action of the former. The *impelled point* of a machine, is that to which the action of the moving power may be conſidered as immediately applied; and the *working point* is that where the reſiſtance ariſing from the work to be performed immediately acts, or to which it ought all to be reduced. Thus in the wheel and axle, *Plate* I. *fig.* 6. *Mechanics*, where the moving power P is to overcome the weight or reſiſtance W, by the application of the cord to the wheel and to the axle, A is the impelled point, and E the working point. The *velocity of the moving power* is the ſame as the velocity of the impelled point; and the *velocity of the reſiſtance*, the ſame as that of the working point. The *performance* or *effect* of a machine, or the *work done*, is meaſured by the product of the reſiſtance into the velocity of the working point; and the *momentum of impulſe* is meaſured by the product of the moving force into the velocity of the impelled point.

Theſe definitions being eſtabliſhed, we may exhibit a few of the moſt uſeful problems relative to the effect of machines, and with which we muſt conclude this article.

Let A B (*Plate* XXXII. *Mechanics*, *fig.* 1.) repreſent the velocity of a ſtream, A C the velocity of the part of the engine which it ſtrikes, when the motion of the machine becomes uniform, and C B will repreſent their relative velocity, upon which the effect of the engine depends. It is known that the action of a fluid upon a given plane, is as the ſquare of this relative velocity; conſequently the weight raiſed by the engine, when its motion becomes uniform, being equal to this action, it is likewiſe as the ſquare of C B. Let this be multiplied by A C, the velocity of the part of the engine, impelled by the fluid; and the effect of the engine in a given time will be proportional to $A\,C \times C\,B^2 =$ (ſuppoſing C B to be biſected in D) $A\,C \times 2\,C\,D \times 2\,D\,B = 4\,A\,C \times C\,D \times D\,B$; conſequently, the effect of the engine is greateſt when the product of A C, C D, and D B is greateſt. But it is eaſy to ſee, that this product is greateſt when the parts A C, C D, and D B, are equal; for if you deſcribe a ſemicircle upon A D, and the perpendicular C E meet the circle in E, then $A\,C \times C\,D = C\,E^2$, and is greateſt when C is the centre of the circle; ſo that in order that $A\,D \times C\,D \times D\,B$ may be the greateſt poſſible, A D muſt be biſected in C; and C B having been biſected in D, it follows that A C, C D, D B, muſt be equal; or that A C, the velocity of the part of the engine impelled by the ſtream, ought to be but one-third of A B, the velocity of the ſtream. In this caſe, when, (abſtracting from friction) the engine acts with the utmoſt advantage; the weight raiſed by it is to the weight that would juſt ſuſtain the force of the ſtream, as the ſquare of C B, the relative velocity of the engine and ſtream, to the ſquare of A B, which would be the relative velocity, if the engine was quieſcent; that is, as 2×2 to 3×3, or 4 to 9. Therefore, that the engine may have the greateſt effect poſſible, it ought to be loaded with no more than $\frac{4}{9}$ths of the weight, which is juſt able to ſuſtain the efforts of the ſtream. See Maclaurin's Account of ſir Iſaac Newton's Diſcoveries, p. 171, and Fluxions, art. 908.

Again, ſuppoſe that a given weight P, (*fig.* 2.) deſcending by its gravity in the vertical line, raiſes a greater weight W, likewiſe given, by the rope P M W, (that paſſes over the fixed pulley M) along the inclined plane B D, the height of which B A is given; and let it be required to find the poſition of this plane, along which W will be raiſed in the leaſt time, from the horizontal line A D to B. Let B C be the plane upon which, if W was placed, it would be exactly ſuſtained by P; in which caſe, P is to W as A B to B C. But W is to the force with which it tends to deſcend along the plane B D, as B D to A B; conſequently the weight P is to that force, as B D to B C. Therefore the exceſs of P above that force (which exceſs is the power that accelerates the motion of P and W) is to P, as $B\,D - B\,C$ to B D; or taking B H upon B C equal to B D, as C H to B D. But it is known that the ſpaces deſcribed by motions uniformly accelerated, are in the compound ratio of the forces which produce them and the ſquares of the times; or, that the ſquare of the time is directly as the ſpace deſcribed in that time, and inverſely as the force; conſequently, the ſquare of the time in which B D is deſcribed by W, will be directly as B D, and inverſely as $\frac{C\,H}{B\,D}$, and will be leaſt when $\frac{B\,D^2}{C\,H}$ is a minimum; that is, when $\frac{B\,C^2}{C\,H} + C\,H + 2\,B\,C$, or (becauſe $2\,B\,C$ is invariable) when $\frac{B\,C^2}{C\,H} + C\,H$, is a minimum. Now as when the ſum of two quantities is given, their product is a maximum when they are equal to each other; ſo it is manifeſt, that, when their product is given, their ſum muſt be a minimum when they are equal. Thus it is evident, that as in *fig.* 1, the rectangle or product of the equal parts A C and C D was equal to $C\,E^2$; ſo the rectangle of any two unequal parts, into which A D may be divided, is leſs than $C\,E^2$, and A D is the leaſt ſum of any two quantities, the product of which is equal to $C\,E^2$. But the product of $\frac{B\,C^2}{C\,H}$ and C H is $B\,C^2$, and conſequently given: therefore the ſum of $\frac{B\,C^2}{C\,H}$ and C H is leaſt when theſe parts are equal, that is, when C H is equal to B C, or B D equal to 2 B C. It appears, therefore, that when the power P and weight W are given, and W is to be raiſed by an inclined plane, from the level of a given point A to the given point B in the leaſt time poſſible; we are firſt to find the plane B C, upon which W would be ſuſtained by P, and to take the plane B D double in length of the plane B C; or we are to make uſe of the plane B D, upon which a weight a weight that is double of W could be ſuſtained by the power P.

For another example; ſuppoſe a fluid, moving with the velocity and direction A C, (*fig.* 3.) ſtrike the plane C E; and ſuppoſe that this plane moves parallel to itſelf in the direction C B, perpendicular to C A, or that it cannot move in any other direction. Then let it be required to find the moſt advantageous poſition of the plane C E, that it may receive the greateſt impulſe from the action of the fluid. Let A P be perpendicular to C E in P, draw A K parallel to C B, and let P K be perpendicular upon it in K, and A K will meaſure the force with which any particle of the fluid impels the plane E C, in the direction C B. For the force of any ſuch particle being repreſented by A C, let this force be reſolved into A Q, parallel to E C, and A P perpendicular to it; and it is manifeſt, that the latter A P only has any effect upon the plane C E. Let this force A P be reſolved into the force A L perpendicular to C B, and the force A K parallel to it; then it is manifeſt, that the former, A L, has no effect in promoting the motion of the plane in the direction C B; ſo that the latter A K, only, meaſures the effort by which the particle promotes the motion of the plane C E in the direction C B. Let E M and E N be perpendicular to C A and C B, in M and N; and the number of particles, moving with directions parallel to A C, incident upon the plane C E, will be as E M. Therefore the effort of the fluid upon C E being as the force of each particle, and the number of particles together, it will be as A K × E M; or, becauſe A K is to A P (= E M) as E N to C E, as $\frac{ME^2 \times EN}{CE}$; ſo that C E being given, the problem is reduced to this, to find when $EM^2 \times EN$ is the greateſt poſſible, or a maximum. But becauſe the ſum of EM^2 and of EN^2 ($= CM^2$) is given, being always equal to CE^2, it follows that $EN^2 \times EM^2$ is greateſt when $EN^2 = \frac{1}{3} CE^2$; in the ſame manner as it was demonſtrated above, that when the ſum of A C and C B (*fig.* 1.) was given, $AC \times CB^2$ was greateſt, when $AC = \frac{1}{3} AB$. But when $EN^2 \times EM^2$ is greateſt, its ſquare root $EN \times EM^2$ is of neceſſity at the ſame time greateſt. Therefore the action of the fluid upon the plane C E, in the direction C B, is greateſt when $EN^2 = \frac{1}{3} CE^2$, and conſequently $EM^2 = \frac{2}{3} CE^2$; that is, when E M, the ſine of the angle A C E, in which the ſtream ſtrikes the plane, is to the radius, as the $\surd 2$ to $\surd 3$; in which caſe it eaſily appears, from the trigonometrical tables, that this angle is of 54° 44′.

Several uſeful problems in mechanics may be reſolved by what was ſhewn in the preceding paragraph. If we repreſent the velocity of the wind by A C, a ſection of the ſail of a windmill, perpendicular to its length by C E, as it follows from the nature of the engine, that its axis ought to be turned directly towards the wind, and the ſail can only move in a direction perpendicular to the axis, it appears, that when the motion begins, the wind will have the greateſt effect to produce this motion, when the angle A C E, in which the wind ſtrikes the ſail, is of 54° 44′. In the ſame manner, if C B repreſent the direction of the motion of a ſhip, or the poſition of her keel, abſtracting from her lee-way, and A C be the direction of the wind, perpendicular to her way, then the moſt advantageous poſition of the ſail C E, to promote her motion in the direction C B, is when the angle A C E, in which the wind ſtrikes the ſail, is of 54° 44′. The beſt poſition of the rudder, where it may have the greateſt effect in turning round the ſhip, is determined in like manner, and the ſame angle enters likewiſe into the determination of the figure of the rhombuſes that form the baſes of the cells in which the bees depoſit their honey in the moſt frugal manner. (See HONEY-*Comb*.) But it is to be carefully obſerved, that when the ſine of the angle A C E is to the radius as $\surd 2$ to $\surd 3$; or, which is the ſame thing, when its tangent is to the radius as the diagonal of a ſquare to its ſide; this is the moſt advantageous angle only at the beginning of the motion of the engine; ſo that the ſails of a common windmill ought to be ſo ſituated, that the wind may indeed ſtrike them in a greater angle than that of 54° 44′. For it is demonſtrable, that when any part of the engine has acquired the velocity c, the effort of the wind upon that part will be greateſt, when the tangent of the angle in which the wind ſtrikes it, is to the radius, not as the $\surd 2$ to 1, but $\surd 2 \times \frac{9c^2}{4a^2} \times \frac{3c}{2a}$ to 1, the velocity of the wind being repreſented by a. If, for example, $c = \frac{1}{3} a$; then the tangent of the angle A C E ought to be double of the radius; that is, the angle A C E ought to be of 63° 26′. If $c = a$; then A C E ought to be of 74° 19′. This obſervation is of the more importance, becauſe, in this engine, the velocity of the parts of the ſail remote from the axis bears a conſiderable proportion to the velocity of the wind, and perhaps ſometimes is equal to it; and becauſe a learned author, Daniel Bernouilli, has drawn an oppoſite concluſion from his computations in his hydrodynamics, by miſtaking a minimum for a maximum; where he infers, that the angle in which the wind ſtrikes the ſail, ought to decreaſe as the diſtance from the axis of motion increaſes; that if $c = a$, the wind ought to ſtrike in an angle of 45°; and that if the ſail be in one plane, it ought to be inclined to the wind, at a medium, in an angle of 50°. How he fell into theſe miſtakes, is ſhewn by Maclaurin, in his Fluxions, § 914.

In like manner, though the angle A C E of 54° 44′ be the moſt advantageous at the beginning of the motion, when a ſhip ſails with a ſide wind; yet it ought to be enlarged afterwards as the motion increaſes. In general, let A a (*fig.* 3.) parallel to C B, be to A C, as the velocity which the engine has already acquired in the direction C B, to that of the ſtream; upon A C produced, take A D to A C as 4 to 3, draw D G parallel to C B, and let a circle deſcribed from the centre C with the radius C a, meet D G in g; and the plane C E ſhall be in the moſt advantageous ſituation for promoting the motion of the engine, when it biſects the angle a C g.

It is generally ſuppoſed, that a direct wind always promotes the motion of a ſhip, the ſail being perpendicular to the wind, more than any ſide-wind; and this has been affirmed in ſeveral late ingenious treatiſes; but, to prevent miſtakes, we are obliged to obſerve, that Maclaurin has demonſtrated the contrary in his Treatiſe of Fluxions, § 919; where other inſtances of this ſecond general problem in mechanics are given, to which we refer. See Maclaurin's Account of ſir Iſaac Newton's Philoſophical Diſcoveries, book ii. chap. 3. p. 173.

Let ϕ denote the abſolute effort of any moving force, when it has no velocity, and ſuppoſe it not capable of any effort when the velocity is W; let F be the effort anſwering to the velocity V, then if the force be uniform, we ſhall have

$$F = \phi \left(1 - \frac{V}{W}\right)$$

For it is the difference between the velocities W and V which is efficient, and the action, being conſtant, will vary as the ſquare of the efficient velocity. Hence we ſhall have this analogy,

$$\varphi : F :: (W - 0)^2 : (W - V)^2,$$

and, conſequently,

$$F = \varphi \left(\frac{W - V}{W}\right)^2 = \varphi \left(1 - \frac{V}{W}\right)^2 \quad \text{Q.E.D.}$$

Although the preſſure of an animal is not actually uniform during the whole time of its action, yet it is nearly ſo, and therefore in general we may adopt this hypotheſis, in order to approximate to the true nature of animal action. On which ſuppoſition the preceding propoſition, as well as the following one, will apply to animal exertion. By retaining the ſame notation, we have alſo

$$W = \frac{V \sqrt{\varphi}}{\sqrt{\varphi} - \sqrt{F}},$$

which formula, applied to the motion of animals, gives the following theorem.

The utmoſt velocity with which an animal, unimpeded, can move, is to the velocity with which it moves when impeded with a given reſiſtance; as the ſquare root of its abſolute force to the difference of the ſquare roots of its abſolute and efficient forces.

Again, to inveſtigate expreſſions by means of which the maximum effect, in machines whoſe motion is uniform, may be determined.

1. It follows from the obſervations made in the preceding part of this article, that when a machine, whether ſimple or compound, is put into motion, the velocities of the impelled and working points are inverſely as the forces which are in equilibrio when applied to thoſe points in the direction of their motion. Conſequently, if f denotes the reſiſtance when reduced to the working point, and v its velocity; while F denotes the force acting at the impelled point, and V its velocity, we ſhall have $F\,V = f\,v$, or introducing t, the time, $F\,V\,t = f\,v\,t$. Hence

In all working machines which have acquired an uniform motion, the performance of the machine is equal to the momentum of the impulſe.

2. Let F be the effort of a force upon the impelled point of a machine, when it moves with a velocity V, the velocity being W, when $F = 0$, and let the relative velocity $W - V = u$.

Then, ſince $F = \varphi \left(\frac{W - V}{W}\right)^2$, by the foregoing propoſition, the momentum of impulſe F V becomes

$$F\,V = V\,\varphi \left(\frac{u}{W}\right)^2 = \varphi \frac{u^2}{W^2} (W - u);$$

becauſe, ſince $W - V = u$, we have $V = W - u$.

Now making this expreſſion for F V a maximum, or ſuppreſſing the conſtant quantities, and making

$$u^2 (W - u) = \text{a maximum},$$

we have, by throwing it into fluxions,

$$2\,u\,\dot{u}\,W - 3\,u^2\,\dot{u} = 0, \text{ or } 2\,W = 3\,u, \text{ or } u = \tfrac{2}{3}\,W:$$

whence, again, $V = W - u = W - \frac{2}{3} W = \frac{1}{3} W$.

Conſequently, when the ratio of V to v is given by the conſtruction of the machine; and the reſiſtance is ſuſceptible of variation, we ought to load the machine more or leſs, till the velocity of the impelled point is one-third of the greateſt velocity of the force, in order that the work done may be a maximum.

Or the work done by an animal is the greateſt when the velocity with which it moves, is one-third of the greateſt velocity with which it is capable of moving when not impeded.

Again, ſince we have

$$F = \varphi \frac{u^2}{W^2} = \varphi \frac{\frac{4}{9} W^2}{W} = \tfrac{4}{9}\varphi,$$

in the caſe of the maximum, we have alſo

$$F\,V = \tfrac{4}{9}\varphi\,V = \tfrac{4}{9}\varphi \cdot \tfrac{1}{3}\,W = \tfrac{4}{27}\varphi\,W,$$

for the momentum of impulſe, or for the work done when the machine is in the beſt ſtate.

Conſequently, when the reſiſtance is a given quantity, we muſt make

$$V : v :: 9f : 4\varphi,$$

which ſtructure of the machine will give the maximum effect $= \frac{4}{27}\varphi\,W$.

If we enquire the greateſt effect on the ſuppoſition that φ only is variable, we muſt make it infinite in the above expreſſion for the work done, which would then become

$$W\,F, \text{ or } W \frac{V}{v} f, \text{ or } W \frac{V}{v} f\,t,$$

including the time in the formula.

Whence we come to this important concluſion, *viz.*

That the ſum of the agents employed to move a machine may be infinite, while the effect is finite.

For the variations of φ, which are proportional to this ſum, do not influence the above expreſſion for the effect. The laſt theorem may be applied to the action of men and of horſes, with more accuracy than might at firſt be ſuppoſed. Obſervations have been made on men and horſes drawing a lighter along a canal, and working ſeveral days together. The force exerted was meaſured by the curvature and weight of the track rope, and afterwards by a ſpring ſteel-yard. The product of the force thus aſcertained into the velocity *per* hour, was conſidered as the momentum; and in this way the action of the men was found to be very nearly as $(W - V)^2$. The action of the horſes, loaded ſo as not to be able to trot, was nearly as $(W - V)^{1\cdot7}$, or as $(W - V)^{\frac{9}{5}}$. Hence the hypotheſis above adopted may, in many caſes, be ſafely aſſumed. According to the beſt obſervations, the force of a man at reſt is on an average about ſeventy pounds, and the utmoſt velocity with which he can walk is about ſix feet *per* ſecond, taken at a medium. Hence in the above theorems $\varphi = 70$, and $W = 6$; conſequently $F = \frac{4}{9}\varphi = 31\frac{1}{9}$lbs., the greateſt force a man can exert when in motion, and he will then move at the rate of $\frac{1}{3}$ W, or two feet *per* ſecond, or rather leſs than 1½ mile *per* hour.

The ſtrength of a horſe is generally reckoned about ſix times that of a man, that is, about 420lbs. at a dead pull. His utmoſt walking velocity is about ten feet *per* ſecond; and therefore his maximum action will be $\frac{4}{9} \times 420 = 186\frac{2}{3}$lbs. and he will then move at the rate of $\frac{1}{3}$ of 10, or $3\frac{1}{3}$ feet *per* ſecond, or nearly 2½ miles *per* hour. In both theſe inſtances we ſuppoſe the force to be exerted in drawing a weight, by a cord running over a pulley, which makes its direction horizontal.

The theorem above given may ſerve to ſhew under what points of view machines ought to be conſidered by thoſe who would labour beneficially for their improvement. The firſt object of utility is in furniſhing the means of giving to the moving force the moſt commodious direction, and when it can be done of cauſing its action to be applied immediately to the body to be moved. Theſe, it is true, can rarely be united, but the former may, in moſt inſtances, be accompliſhed; of which the uſe of the ſimple lever, pulley and wheel and axle, furniſh many examples. The ſecond object gained by the uſe of machines, is an accommodation of the velocity of the work to be performed, to the velocity with which alone a natural power can act. Thus, whenever the working power acts with a certain velocity, which cannot be changed, and the work muſt be performed with a greater velocity, a machine is interpoſed round a fixed ſupport, and the diſtance of the impelled and working points are taken in the proportion of the two given velocities. But the eſſential advantage of machines, and that in fact which properly appertains to the theory of mechanics, conſiſts in augmenting, or rather modifying the energy of the moving power, in ſuch a manner that it may produce effects, of which it would otherwiſe have been incapable. Thus a man might carry up a flight of ſteps twenty pieces of ſtone, each weighing ſay 30lbs. one by one, in as ſmall a time as he could, with the ſame labour, raiſe them all together with a piece of machinery, that would have the velocities of the impelled and working points as twenty to one, and in this caſe the inſtrument would furniſh no real advantage except in ſaving his ſteps. But if a large block of 20 times 30, or 600lbs., were to be raiſed to the ſame height, it would far exceed his utmoſt efforts to accompliſh it, without the intervention of ſome machine. Or the ſame purpoſe may be illuſtrated ſomewhat differently, confining the attention ſtill to thoſe machines whoſe motion is uniform. The product $f\,v$ repreſents, during the unit of time, the effect which reſults from the motion of the reſiſtance; this motion being produced in any manner whatever. If it be produced by applying the moving force immediately to the reſiſtance, it is neceſſary, not only that the product $F\,V = f\,v$, but alſo at the ſame time $F = f$ and $V = v$; if, therefore, as moſt frequently happens, f be greater than F, it will be abſolutely impoſſible to put the reſiſtance in motion, by applying the moving power immediately to it. Now, machines furniſh the means of diſpoſing of the product F V in ſuch a manner, that it may always be equal to $f\,v$, however much the factors F V may differ from the analogous factors in $f\,v$; and conſequently of putting the ſyſtem in motion, whatever may be the exceſs of f above F. Or, generally, as Prony remarks, (Arch. Hydraul. art. 501.) machines enable us to diſpoſe of the factors $F\,V\,t$ in ſuch a manner, that while that product continues the ſame, its factors may have to each other any ratio at pleaſure. Thus, to give another example: ſuppoſe that a man, exerting his ſtrength immediately upon a maſs of 25lbs. can raiſe it vertically, with the velocity of four feet *per* ſecond; the ſame man acting upon a maſs of 1000lbs. cannot give it any vertical motion, though he exerts his utmoſt ſtrength, unleſs he has recourſe to ſome machine. Now he is capable of producing an effect equal to $25 \times 4 \times t$; the letter t being introduced, becauſe, if the labour be continued, the value of t will not be indefinite, but compriſed within aſſignable limits. Thus we have $25 \times 4 \times t = 1000 \times v \times t$; and, conſequently, $v = \frac{1}{10}$th of a foot. This man may, therefore, with a machine as a lever, or axis in *peritrochio*, cauſe a maſs of 1000lbs. to riſe $\frac{1}{10}$th of a foot in the ſame time that he could raiſe 25lbs. 4 feet without a machine; or he may raiſe the greater weight as far as the leſs, by employing forty times as much time. From what has now been ſaid on the extent of the effects which may be attained by machines, it will be ſeen, that ſo long as a moving force exerciſes a determinate effort with a velocity likewiſe determinate, or ſo long as the product of theſe is conſtant, the effects of the machine will remain the ſame: ſo that under this point of view, ſuppoſing the preponderance of the effort of the moving power, and abſtracting from inertia and friction of materials, the convenience of application, &c., all machines are equally perfect. But from what has been ſhewn in the preceding part of this article, a moving force may, by diminiſhing its velocity, augment its effort, and reciprocally. There is, therefore, a certain effort of the moving force, ſuch that its product by the velocity, which comports to that effort, is the greateſt poſſible. Now admitting of the truth of the reſults in the preceding propoſitions $V = \frac{1}{3}\,W$, or $F = \frac{4}{9}\,\varphi$, and theſe two values obtaining together their product, $\frac{4}{27}\,\varphi\,W$ expreſſes the value of the greateſt effect with reſpect to the unit of time; and in practice it will always be adviſable to approach as nearly to theſe values as circumſtances will admit, for it cannot be expected that it can always be exactly attained. But a ſmall variation will not be of much conſequence; for by a well known property of thoſe quantities, which admit of a proper maximum or minimum, a value aſſumed at a moderate diſtance from either of theſe extremes, will produce no ſenſible change in the effect.

If the relation of F to V followed any other law than that which we have aſſumed, we ſhould find from the expreſſion of that law, values of F and V, &c. different from the preceding, but the general method would be ſtill nearly the ſame.

With reſpect to practice, the grand object in all caſes ſhould be to procure an uniform motion, becauſe it is from that which, *ceteris paribus*, the greateſt effect, always reſults. Every irregularity in the motion waſtes ſome of the impelling power, and it is the greateſt only of the varying velocities which is equal to that, which it would acquire if it moved uniformly throughout; for while the motion accelerates, the impelling power is greater than what balances the reſiſtance at that time oppoſed to it, and the velocity is leſs than what the machine would acquire, if moving uniformly; and when the machine attains its greateſt velocity, it attains it becauſe the power is not then acting againſt the whole reſiſtance. In both theſe caſes, therefore, the performance of the machine is leſs than if the power and the reſiſtance were exactly balanced, in which caſe it would move uniformly. Beſides this, when the motion of a machine, and particularly a very ponderous one, is irregular, there are, as we have already remarked in the preceding part of this article, continual repetitions of ſtrains and jolts, which ſoon derange, and ultimately deſtroy the whole ſtructure.

In the preceding remarks and propoſitions, relative to the maximum effect of machines, we have availed ourſelves of an intereſting chapter on this ſubject in Gregory's Mechanics, in which the theory is purſued to a much greater length than our limits will admit of, both with regard to machines whoſe motions are uniform and accelerated; and to which we would refer the reader for further information. See alſo Prony's "Architecture Hydraulique," from art. 487 to 507; and the laſt edition of Ferguſon's Mechanics by Brewſter, in which an intereſting paper on this ſubject is given by profeſſor Leſlie.

Machine for taking down extemporaneous pieces of muſic, commonly called *voluntaries*. Such a contrivance has been long among muſical *deſiderata* of the moſt important kind. To fix ſuch floating ſounds as are generated in the extatic moments of enthuſiaſm, while "bright-eyed fancy

"Scatters from her pictured urn,
Thoughts that breathe, and *notes* that burn,"

would be giving permanence to ideas which reflection can never find, nor memory retain.

The firſt idea of ſuch a contrivance being practicable was ſuggeſted to the Royal Society of London, in a paper written by the late Rev. Mr. Creed, and ſent to the preſident, 1747, under the following title:

"A demonſtration of the poſſibility of making a *machine* that ſhall write *extempore voluntaries*, or other pieces of muſic, as faſt as any maſter ſhall be able to play them, upon an organ, harpſichord, &c. and that in a character more natural and intelligible, and more expreſſive of all the varieties thoſe inſtruments are capable of exhibiting, than the character now in uſe."

This paper was publiſhed the ſame year in the Philoſophical Tranſactions, N° 183, and, afterwards, in Martyn's Abridgment, vol. x. p. 266; and the author's idea always appeared to us ſo feaſible, that we have long wondered at its not having been executed by ſome ingenious Engliſh mechanic.

The firſt mention that we can find to have been made at Berlin, of ſuch a contrivance, was in 1752, in a printed "Weekly Account of the moſt remarkable Diſcoveries in Nature and Science." In 1753, an ample deſcription of ſuch a machine appeared in the ſame weekly publication: and here, in an elaborate preface, the author points out the great want of ſuch a piece of mechaniſm, its utility, and properties; and concludes with ſaying, that this machine, ſo big with advantages to muſic and muſicians, is the *particular invention*, Beſondere Erfindung, of M. Unger.

The deſcription preceded the execution ſome time. The invention was here only recommended to the public, and offered to be completed, and applied to a keyed inſtrument, at a ſmall expence. It was M. Hohlfeld who afterwards conſtructed the machine, and rendered it ſo perfect, that we were aſſured by a great performer, who tried it upon a clavichord, that there was no refinement in muſic which it could not expreſs, except *tempo rubato*.

The deſcription of the Berlin machine ſo much reſembles that propoſed by Mr. Creed, that we ſhall not inſert it here, but refer our readers to the Philoſophical Tranſactions, where he will find that the machine was to conſiſt of two cylinders, which were to be moved by clockwork, at the rate of an inch in a ſecond of time; one of theſe was to furniſh paper, and the other was to receive it when marked by pins or pencils, fixed at the ends of the ſeveral keys of the inſtrument to which the machine was applied. The paper was to be previouſly prepared with red lines, which were to fall under their reſpective pencils.

The chief difficulties in the execution, which have occurred to Engliſh mechanics, with whom we have converſed on the ſubject, were, the preparation of the paper for receiving the marks made by the keys; and the kind of inſtrument which was to ſerve as a pencil, and which, if hard and pointed, would, in the *forte* parts, tear the paper; and if ſoft, would not only be liable to break when uſed with violence, but would be worn unequally, and want frequent cutting.

In the Berlin machine the pencils were approximated according to Mr. Creed's idea, and made to terminate in a very narrow compaſs, ſo that paper of an uncommon ſize was not requiſite; but it was not found neceſſary to prepare the paper, as propoſed in the Philoſophical Tranſactions; for the degree of gravity or acuteneſs of each ſound was aſcertained by a ruler applied to the marked paper, when taken off the cylinder.

About the year 1780, the late ingenious and marvellous mechanic Merlin, ſtimulated by the reports of this machine having been ſucceſsfully conſtructed in Germany, and by our earneſt recommendation of the undertaking, went to work, and apparently vanquiſhed all the difficulties of conſtruction, except the time inevitably neceſſary for its completion; as he was never able to ſimplify the mechaniſm ſo much as to render its appropriation within the reach of great compoſers and voluntary players in general, to whoſe uſe only it ſeems to belong; he diſpoſed of his model to a foreign nobleman, who had it conveyed to Germany, and we believe never fabricated another machine of the ſame kind. See MERLIN.

MACHINE, in *Dramatic Poetry*, is when the poet brings ſome divinity or ſupernatural being upon the ſtage; to perform ſome exploit, or ſolve ſome difficulty, out of the reach of human power.

The machines of the drama are gods, angels, ghoſts, &c. They are ſo called from the machines or contrivances by which they are repreſented upon the ſtage, and afterwards removed again.

Hence the uſe of the word machine has alſo paſſed into the epic poem; though the reaſon of its name be there wanting. It denotes, in both caſes, the intervention or miniſtry of ſome divinity; but as the occaſion of machines in the one and the other is ſomewhat different, the rules and laws of managing them are different likewiſe.

The ancient dramatic poets never brought any machine on the ſtage, but where there was an abſolute neceſſity for the preſence of a god; and they were generally laughed at for ſuffering themſelves to be reduced to ſuch a neceſſity. Accordingly, Ariſtotle lays it down as an expreſs law, that the unravelling of the piece ſhould ariſe from the fable itſelf, and not from any foreign machine, as in the Medea. Horace is ſomewhat leſs ſevere, and contents himſelf with ſaying, that the gods ſhould never appear, unleſs where the *nodus*, or knot, is worthy of their preſence; "Nec deus interſit, niſi dignus vindice nodus—inciderit." But it is quite otherwiſe with the epopea; in that there muſt be machines every where, and in every part. Homer and Virgil do nothing without them. Petronius, with his uſual fire, maintains, that the poet ſhould deal more with the gods than with men; that he ſhould every where leave marks of his prophetic raptures, and of the divine fury that poſſeſſes him; that his thoughts ſhould be all full of fables, that is, of allegories and figures: in fine, he will have a poem diſtinguiſhed from a hiſtory in all its parts; not ſo much by the verſes, as by that poetical fury, which expreſſes itſelf wholly by allegories; and does nothing but by machines, or the miniſtry of the gods. A poet, therefore, muſt leave it to the hiſtorian to ſay, that a fleet was diſperſed by a ſtorm, and driven to foreign ſhores; and muſt himſelf ſay, with Virgil, that Juno went to ſeek Æolus: and that this god, at her requeſt, turned the winds looſe againſt the Trojans: he muſt leave the hiſtorian to write, that a young prince behaved with a great deal of prudence and diſcretion on all occaſions; and muſt ſay, with Homer, that Minerva led him by the hand in all his enterprizes: let an hiſtorian ſay, that Agamemnon, quarrelling with Achilles, hath a mind to ſhew him, though miſtakenly, that he can take Troy without his aſſiſtance; the poet muſt ſay, that Thetis, piqued at the affront her ſon had received, flies up to heaven, there to demand vengeance of Jupiter: and that this god, to ſatisfy her, ſends the god Somnus, or Sleep, to Agamemnon, to deceive him, and make him believe that he ſhall take Troy that day.

It is thus that the epic poets uſed machines in all parts of their works; in the Iliad, Odyſſey, and Æneid, the propoſition mentions them; the invocation is addreſſed to them; and the narration is full of them: they are the cauſes of actions; they make the knots, and at laſt they unravel them. This laſt circumſtance is what Ariſtotle forbids in the drama; but it is what Homer and Virgil have both practiſed in the epopea. Thus Minerva fights for Ulyſſes againſt Penelope's lovers; helps him to deſtroy them; and, the next day, herſelf makes the peace between Ulyſſes and the Ithacans; which cloſes the Odyſſey. The uſe of machines in the epic poem is, on ſome accounts, entirely oppoſite to what Horace preſcribes for the theatre. In tragedy, that critic will never have them uſed without an abſolute neceſſity; whereas, in the epopea, they ſhould never be uſed, but where they may be as well let alone; and where the action appears as if it did not neceſſarily require them. How many gods and machines does Virgil implore to raiſe the ſtorm that drives Æneas into Carthage; which yet might eaſily have happened in the ordinary courſe of nature.

In Milton's Paradiſe Loſt, moſt of the actors are ſupernatural perſonages; and in Voltaire's Henriade, the poet has made excellent uſe of St. Louis.

Machines, in the epic poem, therefore, are not contrivances of the poet, to recover himſelf after he has made a falſe ſtep, nor to ſolve any difficulty peculiar to ſome part of the poem; but it is the preſence of a divinity, and ſome ſupernatural and extraordinary action, which the poet inſerts in moſt of the incidents of his work, to render it more majeſtic and admirable, and to train up his readers to piety and virtue. This mixture ſhould always be ſo managed, as that the machines may be retrenched, without retrenching any thing from the action. As to the manner in which the machines are to act; it may be obſerved, that in the old mythology, there are gods both good, bad, and indifferent; and that our paſſions may be converted into ſo many allegorical divinities: ſo that every thing, both good and bad in a poem, may be attributed to theſe machines, and may be tranſacted by them. They do not, however, always act in the ſame manner; ſometimes they act without appearing, and by ſimple inſpirations, which have nothing in them extraordinary or miraculous; as when we ſay, the devil ſuggeſted ſuch a thought, &c. The ſecond manner of acting is entirely miraculous; as when a divinity preſents itſelf viſible before men, ſo as to be known by them; or when they diſguiſe themſelves under ſome human form without diſcovering themſelves. The third manner partakes of each of the two, and conſiſts in oracles, dreams, and extraordinary inſpirations: all which Boſſu calls *demi-machines*.

All theſe manners ought to be ſo managed as to carry a veriſimilitude: and though veriſimilitude be of a vaſt extent in machines, as being founded on the divine power, yet it has its bounds. See farther, on the importance and uſe of machinery, the article Epic *Poem*.

Machine, in *Agriculture*, a term applied to inſtruments of various kinds which are contrived either for the purpoſe of leſſening labour or performing the different operations and proceſſes of the art with greater accuracy and correctneſs, ſuch as thoſe of ſowing, drilling, reaping, threſhing, winnowing, and a great many others. The term is moſt commonly employed when the nature of the tool is of the more complex kind. It may, however, be employed with propriety in many other circumſtances. See Threshing *Machine*.

Machine, *Architectonical*, is an aſſemblage of pieces of wood ſo diſpoſed, as that, by means of ropes and pullies, a ſmall number of men may raiſe vaſt loads, and lay them in their places. Such are cranes, &c.

It is hard to conceive what ſort of machines the ancients muſt have uſed to raiſe thoſe immenſe ſtones found in ſome of the antique buildings. See Machine, *ſupra*.

Machine, *Blowing*. See Bellows, and Blowing *Machine*.

Machine, *Bruiſing*, a contrivance for the purpoſe of cruſhing and reducing grain, pulſe, malt, and other articles, ſome of which are employed as team food. Machines of this kind are made in London by Rowntree and others.

Machine, *Chaff-cutting*, a tool contrived for the purpoſe of cutting ſtraw, hay, and other ſimilar materials into chaff for the purpoſe of food for team-horſes, and other animals. There are various deſcriptions of this kind of machinery which act on very different principles, and ſome of them have lately undergone very much improvement. See Chaff-cutter.

Machine, *Draught*, a ſimple contrivance formed for the purpoſe of aſcertaining the force or power of draught, in drawing ploughs, and various other implements where draught is required. A machine of this ſort, invented by Mr. More, late ſecretary to the Society for the Encouragement of Arts, &c. in London, is thus deſcribed by Mr. Young in the firſt volume of the Annals of Agriculture. It is a ſpring coiled within a cylindrical caſe, having a dial-plate, marked with numbers like that of a clock, and ſo contrived that a hand moves with the motion of the ſpring, and points to the numbers in proportion as the force is exerted: for inſtance, when the draught equals 1 cwt. over a pulley, the hand points to *fig.* 1; when the draught is equal to 2 cwt. it points to *fig.* 2; and ſo on. Till this very uſeful machine was invented, Mr. Young ſays, it was exceedingly difficult to compare the draught of different ploughs, as there was no rule to judge but by the exertions of the horſes as apparent to the eye; a very indeciſive mode of aſcertaining their force.

Machine, *Drill*, that ſort of tool which is employed in ſowing and depoſiting various kinds of grain, pulſe, and ſmall ſeeds, in drills or rows. They are very differently formed, according to the purpoſes for which they are intended, and the manner of drilling which is intended to be practiſed.

They require to be conſtructed with great correctneſs, and in as ſimple a manner as poſſible, in order that they may perform their work with accuracy, both in reſpect to the drills, the quantity of ſeed, and the depth of depoſiting it in the ſoil.

In the choice of this ſort of machinery, the farmer ſhould be principally directed by the nature and extent of his land, the ſituation which it poſſeſſes, and the kinds of crops which he intends to cultivate. They have lately been ſo contrived, as, by ſlight alterations in the ſowing parts, to be capable of not only ſowing grain as well as ſmall ſeeds, but of executing the work at different diſtances, and in a greater or leſs number of rows at once, as circumſtances may require.

There are ſeveral machines of this nature, which perform the buſineſs in a very exact and regular manner; among which are Cook's, Bailey's, Amoſe's, M'Dougal's, and many others; each of which ſow ſeveral rows at the ſame time, and ſome of them are likewiſe capable of forming horſe-hoes.

Beſides theſe, there are alſo drills conſtructed for particular ſorts of crops, as thoſe of peas, beans, turnips, &c. See PLOUGH *Drill*, and TURNIP *Drill*.

A drill machine, invented by Mr. Robert Salmon of Woburn, Bedfordſhire, which obtained the premium given by the duke of Bedford, at Woburn ſheep-ſhearing, a few years ago, for the beſt newly-invented agricultural implement, is deſcribed below. This machine drills and ſows at the ſame time; and the principal improvement in it, as in Cook's drill, and others, conſiſts in conſtructing it in ſuch a manner, that the workman who holds the drill has a perfect command upon it, with reſpect to the direction in which it ſhall move, even though the horſe which draws it ſhould deviate from the line the drill is intended to follow. In *Plate* (*Machines*) *Agriculture*, is given a deſcriptive repreſentation of the machine, in which *fig.* 1 is a ſection of a part, *fig.* 2 an elevation of the ſame, *fig.* 4 is a perſpective view of the whole, and *figs.* 3 and 5 detached parts.

The great wheels, A, A, *fig.* 4, have their axle-trees attached to the bed B, to which are framed the long handles, D, D, forming a frame independent of the remainder of the machine, and having no connection with it, except in the middle of the bed B, where a ſhort beam, E, is jointed to it, as is well explained in *fig.* 1; the other end of this beam is mortiſed into a croſs beam F, to which the three drills, G, G, G, are fixed; a frame formed of two horizontal pieces, H, H, *figs.* 2 and 4, and four vertical pieces, I, I, I, I, is erected upon F; the handles, D, D, paſs between H, H, but are not fixed thereto; the hook *a*, by which the machine is drawn, is fixed to the two middle uprights, I, I, and a ſtrong chain leads to the harneſs of the horſe employed; K is the ſeed-box ſupported from H, H, by two uprights for the purpoſe; the box is a fruſtum of a pyramid, and joins at the bottom to a priſmatic box, containing the ſeed-roller *b*, *fig.* 1, which is exactly the ſame length as the box, and comes through its ends, its pivots being ſupported by a piece of iron-plate fixed at the end of the box, as ſeen in *fig.* 4; a bruſh, *d*, preſſes upon the roller, and is adjuſtable by a ſcrew that it may always bear upon it with an equal degree of force; a number of notches is cut in the circumference of the roller, and as the box K is full of ſeed, it always reſts upon the roller; when it turns round, it takes one of the notches full of ſeed, and paſſing it by that means under the end of the bruſh *d*, delivers it into a tin-plate tube *r*, which conveys it down into the furrow made by the drill; the roller has three ſeries of notches anſwering to the three drills G, G, G; at *e*, a piece of leather preſſes againſt the roller, to prevent any ſeed getting down, except that which paſſes under the bruſh *d*; *f* is a ſlider, which ſtops the ſeed from coming down to the roller, when ſhoved in, and is uſed when the machine is required to advance without ſowing, or when a leſſer number of rows is required to be ſown. The roller is turned by means of an endleſs chain, *q q*, paſſing round a groove made in the middle of the roller, from thence it proceeds through a block of pullies at *t*, ſhewn ſeparate in *fig.* 5, to a ſmall wheel *h*; the block, *t*, is made of caſt-iron, and ſlides freely up and down between the two innermoſt uprights, I, I, of the frame; its weight keeps the chain always tight, and prevents it from ſlipping without turning the roller; the wheel, *h*, is fixed upon an axle *p*, on the end of which is a cog-wheel, turned by another cog-wheel on the nave of the great wheel A; theſe wheels are encloſed in a box *k*, which likewiſe contains a contrivance for diſengaging the wheels, ſhewn on a larger ſcale in *fig.* 3, where *p* is a ſection of the axle *p*, paſſing through a long ſtaple fixed to the bed B; it can ſlide up and down in this ſtaple, except when confined by a catch *o*, preſſed againſt it by a ſpring. In the preſent poſition, the cog-wheels are engaged to work together: but by pulling the cords *m* and *l*, the former draws back the catch *o*; and the other, by means of the crooked lever *n n*, raiſes up the axle *p*, and diſengages the cog-wheels; the return of the catch, *o*, prevents its deſcent; the cords, *l* and *m*, are conducted to the end of the handles, D, D where they are both attached to one handle, in reach of the workman who guides the machine.

The operation of the drill is exceedingly ſimple. As the horſe draws it along by means of the chain, the drills, G, G, G, make the furrows, and the ſeed-roller delivers the ſeed in ſmall quantities, and at regular intervals into them. As the hook *a*, from which the chain draws, is placed nearly in the centre of the machine, it will eaſily be made to follow any other line than that in which the horſe draws, by turning the handles, D, D, to one or other ſide. This alters the direction of the wheels, A, A, which immediately proceed in that line, and the drill follows them. This quality is of the greateſt conſequence in making ſtraight work. L is a croſs piece fixed to the handles, D, D, and ſupporting a handle M, by which, and one of D, the workman holds when he guides the drill, as he is then in a poſition to ſee the drills made laſt, and adapt the preſent ones to them; the wheel always going in the laſt made drill. Another handle, ſimilar to M, is fixed to the other end of L, to be uſed when the machine is on the other ſide of the work done laſt. The drills are fixed to the piece F by ſcrews, and their diſtance from one another can be altered at pleaſure. The ſeed-box containing the roller is made in two halves, connected by hooks, ſo that it can be taken apart, and the roller removed for a freſh one to be put in with different ſized notches, for ſowing a different kind of grain.

The drawing was taken from a machine made by Mr. Shepherd, Woburn, and exhibited at Woburn ſheep-ſhearing, June 1808. Mr. Salmon has made a great number of the ſame pattern, which are now in uſe, and are found to anſwer well. Several of them have five drills inſtead of three, and are in that caſe worked by one horſe.

In this drill, at whatever diſtance the ſhares are placed to go from each other, the diſtance from the wheels to the two outſide rows is alway equal thereto; conſequently, when at work, one or the other of the wheels always runs in the laſt made drill, thereby guaging accurately the interval between each bout the drill goes; and as the holder always goes in the line of the wheel, he can diſtinctly ſee and correct the ſmalleſt error that may have been made in any previous bout.

In all caſes, one horſe is ſufficient to draw this drill either for three or more rows, as little depends on the horſe's inclination; and a driver can be diſpenſed with, where tractable horſes are uſed. As in all machines of this ſort, in proportion to the number and diſtance of rows made, ſo will be the quantity of work performed.

MACHINE, *Electrical.* See ELECTRICAL *Machine*.

MACHINE, *Fan*, in *Agriculture*, a common name applied to that ſort of tool which is employed in removing the chaff from the grain. See WINNOWING *Machine*.

MACHINE, *Land-Levelling*, the name of an uſeful machine, invented by Mr. David Charles, for the purpoſe of rendering high ridges and other inequalities, in ſuch lands as are in a ſtate more level and even in their ſurfaces. It would ſeem probable that no effective implement of this ſort has hitherto been introduced. But ſuch a machine is ſaid, in "Tranſactions of the Society of Arts," to be uſeful and neceſſary even in the moſt fertile parts of the country, where the improved ſyſtem of drill-huſbandry has been introduced, or even where there is any attention to the waſte of time, or to the eaſe of cattle in the act of ploughing; in order to get rid of crooked or unequal ridges, without either a ſummer fallow by croſs ploughing, or elſe by frequent repetitions of ploughing in the winter and ſpring, which the humidity of this climate will not allow in every kind of ſoil. "Fourteen acres of land were reduced with this tool by the inventor to a perfect level, where the crowns of the ridges were about two feet higher than the furrows, and where they were crooked and of unequal breadths. But the chief ſucceſs has been upon a field of eight acres, which lay in an unprofitable ſtate, and which is a deep clay, that had produced a crop of wheat from an old lay ſod the former year, without any manure, which was winter ploughed, and lay in that ſtate until the machine was introduced the firſt dry weather in April. It was preceded by two horſe ploughs, taking perhaps a ſquare of an acre at once: theſe looſened the ſoil the depth of a common furrow, and twice the breadth acroſs the ridges. The levelling machine followed, drawn by two oxen and two horſes, with a man at each handle, to preſs it down where the height was to be removed, and to lift up the body by the handles where it was to be diſcharged. Thus, four men, one driver, and eight head of cattle, will more effectually level from half an acre to three roods in one day, according as the earth is light or heavy, than ſixty or eighty men would accompliſh with harrows and ſhovels, &c. even with the aſſiſtance of a plough. In ſandy ground, where the depth of one furrow will bring all to a level, as much, of courſe, will be done in one day as two ploughs can cover;" but in this caſe, the ground required to be gone over ſeveral times. It is further ſtated, that "after this field was levelled, the backs of the ridges, as they are termed, which were ſtripped of their vegetable mould, were ploughed up, the furrows not requiring it. They were alſo harrowed, and the field copiouſly manured with lime-compoſt, harrowed in, and broke into nine feet ridges, perfectly ſtraight, in order to introduce Duckit's drill. It was ſown under furrow, broad-caſt, the laſt of it not until the 13th of May, and was cut down a reaſonable crop the 4th of September." And "the field now lies in proper form, well manured, with the advantage of a fair crop from heavy tenacious ground, without loſing a ſeaſon, and in a year by no means favourable." The writer is "well aware there are many ſhallow ſoils, where it may be hazardous to remove the enriched ſurface, and truſt perhaps one half of the land for a crop that had never before been expoſed to the atmoſphere; but where the ſoil is ſufficiently deep, or there is a good under-ſtratum, with manure at hand to correct what is ſour for want of expoſure and tillage, it is evident, from this experiment, that no riſk is run." And in order "to avoid the expence of a fallow, and to lay out ground in ſtraight and even ridges, even where drill huſbandry is not practiſed, ſhould be objects to every rational farmer: but where the new ſyſtem is intended to be adopted, it becomes indiſpenſibly neceſſary. In laying down lawns, parks, &c. where furrows are an eye-ſore, or places inacceſſible to wheel-carriages from their declivity, and from which earth is to be removed, it will alſo be found equally uſeful." Beſides theſe, there are many other caſes in which the old rounded ridges may be levelled down with great advantage, either by this or ſome other means.

A repreſentation of this machine is given at *fig.* 1. in *Plate* (*Machines*) *Agriculture*, in which *a*, *fig.* 2. is a part of the pole, to which the oxen or horſes which draw the machine are faſtened, and which is attached to the machine by a pin at *b*; *c*, *c*, the two wheels, ſhod with iron, which run upon the axle *d*; *e e*, the upper frame work of the machine, extending from the axle to the extremity of the handles, *f*, *f*, and ſecured firmly by the croſs pieces, *g*, *g*, the curved iron ſliders of the machine, which may be raiſed or depreſſed a little by means of the pins, *h*, *h*, which paſs through holes in the wood-work, and alſo in the iron ſliders. Theſe ſliders form one piece with the back iron ſcraper *i*, in the manner more fully explained in *fig.* 3, *k*, the wooden back of the machine, which ſhould be made ſtrong, to reſiſt the weight of the earth when collected therein. The iron ſcraper ſhould be firmly ſecured to this by ſcrews and iron work; *l*, *l*, the wooden ſides of the machine, firmly connected with the back and frame work, in order to aſſiſt in collecting the earth to be removed; *m*, a ſtrong croſs piece, into which the ribs which ſupport the back are well mortiſed.

The interior part of the back of the machine is ſhewn at *k*, in *fig. 3*: *i*, the iron ſcraper, ſharp at the bottom, firmly ſcrewed to the back of the machine; *g*, *g*, parts of the ſide irons or ſliders, ſhewing the mode in which they are united with the ſcraper *i*; *m*, the croſs piece already deſcribed.

MACHINES, *Military*, among the *Ancients*, were of three kinds: the firſt ſerving to launch arrows, as the ſcorpion; or javelins, as the catapulta; or ſtones, as the baliſta; or fiery darts, as the pyrabolus: the ſecond ſerving to beat down walls, as the battering ram and terebra: and the third to ſhelter thoſe who approach the enemies wall, as the tortoiſe or teſtudo, the vinea, pluteus, and the towers of wood. Theſe machines, together with their proportions and properties, are deſcribed in the works of Vitruvius, Ammianus Marcellinus, and other writers. Mr. Groſe has given deſcriptions and drawings of theſe in the *firſt* volume of his "Military Antiquities," chap. xii.

MACHINE, *Stone-lifting*, in *Agriculture*, an implement of the triangle kind, ſimilar to that uſed by wood-cutters for weighing bark, conſtructed for the purpoſe of raiſing large ſtones of ſome tons weight uſed in the northern parts of Scotland, and many other places. It is ſuppoſed to ſave much expence in powder and boring as well as labour, three men being ſufficient to work it. It is deſcribed in the Agricultural Survey of Perthſhire in this manner.

"The three legs, *a d*, *b d*, and *c d*, which are ſhewn at *fig.* 4, are beams of any hard wood, four inches thick, ſix inches broad, and about fourteen feet long. Their thinneſt ſide points inwards, which gives them more ſtrength. Their feet form on the ground an equilateral triangle *a b c*, and their three tops at *d* are fixed together by an iron rod, which paſſes through each. The two legs *a d* and *b d* are fixed to one another by the windlaſs *k*, and by the croſs-bar *o p q*. There are two pullies *e* and *f*, with an iron hook two inches in circumference to each; *g g g* may be (more than one, but rather) one iron chain which goes round the ſtone *n*, while lying in the ground at *m*, below its greateſt diameter, or where it begins to become narrow. This chain conſiſts of rounded links, which are about three inches long, and about the thickneſs of a man's little finger. It has a hook at one end, that may be put into any link towards the other end, which will make it embrace the ſtone exactly, and be of the ſame circumference, where the ſtone touches the earth; *h g*, *h g*, *h g*, are ſhorter chains of the ſame workmanſhip, whoſe hooks are fixed into links of the ſurrounding chain at *g g g*, and ſo on round the ſtone, having the correſponding link of each fixed on the hook of the lower pulley at *h*. The whole rope muſt be of the ſame thickneſs with the two great hooks, two inches in circumference.

"All things being thus prepared, two men turn round the handles of the cylinder, and the waggoner aſſiſting them by applying a lever to any ſide of the ſtone that ſeems to be firmeſt, they force it aloft, and hold it up at the proper height, until the driver put his carriage backward between *b* and *c*, which carriage ought to have a ſtrong frame upon four low ſtout wheels; then the ſtone is let gently down and carried away."

By this ſort of machine large ſtones or other bodies can be raiſed and removed without any great difficulty.

Machine, *Threſhing*, a contrivance made uſe of inſtead of the flail for threſhing corn and other ſeed crops. See Threshing *Machine*.

Machine, *Water*, or *Hydraulic*, is either uſed to ſignify a ſimple machine, ſerving to conduct or raiſe water; as a ſluice, pump, &c. or ſeveral of theſe acting together, to produce ſome extraordinary effect; as the

Machine *of Marli*. See Marli. See alſo Fire-*engine*, Steam-*engine*, and Water-*works*.

Machine, *Water-raiſing*, a ſort of machine contrived for the purpoſe of raiſing water a few feet high by the power of the *wind*, for the purpoſe of draining moraſſes, or of watering lands on a higher level, and other ſimilar uſes. A ſection of it is given at *fig.* 5, and it is deſcribed by the author of the Philoſophy of Agriculture and Gardening to "conſiſt of a windmill ſail placed horizontally, like that of a ſmoke-jack, ſurrounded by an octagon tower; the diverging rays of this tower, *a b*, *a b*, may conſiſt of two-inch deals only, if on a ſmall ſcale, or of brick-work if on a larger one. Theſe upright pillars are connected together by oblique horizontal boards at A B, by which boards placed horizontally from pillar to pillar in reſpect to their length, but at an angle of about 45 degrees in reſpect to their breadth, ſo as to form a complete octagon, including the horizontal windmill ſail near the top of it; the wind, as it ſtrikes againſt any of them, from whatever quarter it comes, is bent upwards, and then ſtrikes againſt the horizontal wind-ſail. Theſe horizontal boards, which form the ſides of the octagon, may either be fixed in their ſituations, or be made to turn upon an axis a little below their centres of gravity, ſo as to cloſe themſelves on that ſide of the octagon tower moſt diſtant from the wind. It may be ſuppoſed that the wind thus reflected, would loſe conſiderably of its power before it ſtrikes on the wind-ſail; on fixing a model of ſuch a machine, however, on the arm of a long whirling lever, with proper machinery to count the revolutions of the wind-ſail, when thus included in a tower, and moving horizontally; and then when moved vertically, as it was whirled on the arm of the lever with the ſame velocity, it was found on many trials by Mr. Edgeworth, in Ireland, and Dr. Darwin, at Derby, that the wind, by being thus reverted upwards by a fixed planed board, did not ſeem to loſe any of its power. And as the height of the tower may be made twice as great as the diameter of the ſail, there is reaſon to conclude, the doctor thinks, that the power of the horizontal wind-ſail may be conſiderably greater, than if the ſail was placed nearly vertically oppoſed to the wind in the uſual manner. At the bottom of the ſhaft of the wind-ſail is placed a centrifugal pump with two arms at D, C, which conſiſts ſimply of an upright bored trunk, or cylinder of lead, with two oppoſite arms with an adapted valve at the bottom to prevent the return of the water, and a valve at the extremity of each arm to prevent any ingreſs of air above the current of the water as it flows out; *c c c c* is a circular trough to receive the ſtreams of water from C and D, to convey them where required in any particular operation or proceſs.

And at *fig.* 6 is another machine, invented by Mr. Sergeant, of Whitehaven, calculated for raiſing or forcing water in particular caſes, as for domeſtic or other uſes. It is extremely ſimple and cheap in its conſtruction, the whole, excluſive of the pump pipes, &c. not coſting more than five pounds. The object for which it was particularly contrived was that of raiſing water for the ſupply of a gentleman's houſe from a ſtream running at the diſtance of about 140 yards. In which intention a dam was made a little diſtance above, ſo as to cauſe a fall of about four feet, the water being brought by a wooden trough, into which was inſerted a piece of two-inch leaden pipe, a part of which is ſeen at *a*, in the figure; the ſtream of this pipe is ſo directed as to run into the bucket *b c*, when the bucket is elevated; but as ſoon as it begins to deſcend, the ſtream flows over it, and goes to ſupply the wooden trough, or well, in which the foot of the forcing pump, *c*, ſtands, of three inches bore; *d* is an iron cylinder attached to the pump rod, which paſſes through it, which is filled with lead, and is in weight about 240 pounds. This is the power which works the pump, forcing the water through 240 feet of inch pipe from the pump up to the houſe. At *e* a cord is fixed, which, when the bucket comes to within four or five inches of its loweſt projection, becomes ſtretched, and opens a valve at the bottom of it, through which the water diſcharges itſelf. This ſort of pump may be found very beneficial in a variety of inſtances where its application can be admitted.

Machine, *Wind*. See Anemometer, and Wind *Machine*.

MACHINERY, in the Lyric theatre, or Opera-houſe. In the early operas of Italy, during the 17th century, it ſeldom happened that the names of the poets, compoſers, or ſingers, were recorded in printed copies of the words; though that of the machiniſt was ſeldom omitted; and much greater care ſeems to have been taken to amuſe the eye than the ear or intellect of thoſe who attended theſe ſpectacles.

In 1675, we are told, in the Theatrical Annals of Venice, that a muſical drama, called La Diviſione del Mondo, written by Giulio Ceſare Corradi, and ſet by Legrenzi, excited univerſal admiration, by the ſtupendous machinery and decorations with which it was exhibited. And in 1680, the opera of Berenice, ſet by Domenico Freſchi, was performed at Padua in a manner ſo ſplendid, that ſome of the decorations recorded in the printed copy of the piece ſeem worthy of notice in this article. The muſical drama conſiſted of poetry, muſic, dancing, machinery, and decorations; and it would be curious to point out the encroachments which any one of theſe conſtituent parts at different periods has made upon the reſt. In the beginning it was certainly the intention of opera legiſlators to favour Poetry, and make her miſtreſs of the feaſt; and it was a long while before Muſic abſolutely took the lead. Dancing only ſtept into importance during the laſt century; but very early in the 17th century, machinery and decorations were ſo important, that little thought or expence was beſtowed on poetry, muſic, or dancing, provided ſome means could be deviſed of exciting aſtoniſhment in the ſpectators, by ſplendid ſcenes and ingenious mechanical contrivances.

In the opera of Berenice juſt mentioned, there were choruſes of one hundred virgins, one hundred ſoldiers, one hundred horſemen in iron armour, forty cornets of horſe, ſix trumpeters on horſeback, ſix drummers, ſix enſigns, ſix ſacbuts, ſix great flutes, ſix minſtrels playing on Turkiſh inſtruments, ſix others on octave flutes, ſix pages, three ſerjeants, ſix cymbaliſts, twelve huntſmen, twelve grooms, ſix coachmen for the triumph, ſix others for the proceſſion, two lions led by two Turks, two elephants by two others, Berenice's triumphal car drawn by four horſes, ſix other cars with priſoners and ſpoils drawn by twelve horſes, ſix coaches for the proceſſion. Among the ſcenes and repreſentations in the firſt act, was a vaſt plain, with two triumphal arches; another, with pavilions and tents; a ſquare prepared for the entrance of the triumph; and a foreſt for the chace. Act II. the royal apartments of Berenice's temple of vengeance; a ſpacious court, with a view of the priſon; and a covered way for the coaches to move in proceſſion. Act III. the royal dreſſing room, completely furniſhed; ſtables with one hundred live horſes; portico adorned with tapeſtry; a delicious palace in perſpective. And beſides all theſe attendants and decorations, at the end of the firſt act, there were repreſentations of every ſpecies of chace: as of the wild boar, the ſtag, deer, and bears; and at the end of the third act, an enormous globe deſcends from the ſky, which opening divides itſelf into other globes that are ſuſpended in the air, upon one of which is the figure of Time, on a ſecond that of Fame, on others, Honour, Nobility, Virtue, and Glory. Had the ſalaries of ſingers been at this time equal to the preſent, the ſupport of ſuch expenſive and puerile toys, would have inclined the managers to enquire, not after the beſt, but the cheapeſt vocal performers they could find; as ſplendid ballets often oblige them to do now; and it is certain, that during the 17th century, the diſtinctive characteriſtic charm of an opera was not the muſic, but machinery. The French eſtabliſhed muſical dramas in their court and capital during the rage for mythological repreſentations, to which they have conſtantly adhered ever ſince; and when they are obliged to allow the muſical compoſition and ſinging to be inferior to that of Italy, they comfort themſelves and humble their adverſaries by obſerving, that their opera is, at leaſt, a fine thing to ſee: "c'eſt au moins un beau ſpectacle, qu'un opera en France."

Machinery, in *Mechanics*, may be conſidered as the operative and moving parts of machines; it is, however, very generally, though perhaps improperly, applied to include all the parts of machines, fixed as well as moving, and in this view may be conſidered as the inſtruments or parts by which the principles of mechanics are carried into execution, and rendered applicable to all the purpoſes of arts and manufactures.

The denomination machine is now vulgarly given to a great variety of ſubjects that have very little analogy by which they can be claſſed with propriety under one name: we ſay a travelling machine, a bathing machine, a copying machine, a threſhing machine, an electrical machine, &c. &c. The only circumſtances in which all theſe agree, ſeem to be, that their conſtruction is more complex and artificial than the utenſils, tools, or inſtruments which offer themſelves to the firſt thoughts of uncultivated people; they are more artificial than the common cart, the bathing tub, the flail, or the glaſs tube which firſt diſcovered the phenomena of electricity. In the language of ancient Athens and Rome, the term was applied to every tool by which hard labour of any kind was performed; but in the language of modern Europe, it ſeems reſtricted either to ſuch tools or inſtruments as are employed for executing ſome philoſophical purpoſe, or of which the conſtruction employs the ſimple mechanical powers in a conſpicuous manner, ſo that their operation and energy engage the attention. It is nearly ſynonimous, in our language, with *engine;* a term altogether modern, and in ſome meaſure honourable, being beſtowed only, or chiefly, on contrivances for executing work in which ingenuity and mechanical ſkill are manifeſt. Either of theſe terms, machine or engine, is applied with impropriety to contrivances in which ſome piece of work is not executing on materials, which are then ſaid to be manufactured. A *travelling* or *bathing* machine is ſurely a vulgariſm.

A machine or engine is, therefore, a tool, but of complicated conſtruction, peculiarly fitted for expediting labour, or for performing it according to certain invariable principles: and we ſhould add, that the dependence of its efficacy or mechanical principles muſt be apparent, and even conſpicuous.

The contrivance and erection of ſuch works conſtitute the profeſſion of the engineer; a profeſſion which ought by no means to be confounded with that of the mechanic, the artiſan, or manufacturer. It is one of the *Artes liberales;* as deſerving of the title as medicine, ſurgery, architecture, painting, or ſculpture. Nay, whether we conſider the importance of it to this flouriſhing nation, or the ſcience that is neceſſary for giving eminence to the profeſſor, it is very doubtful whether it ſhould not take place of the three laſt named, and go *pari paſſu* with ſurgery and medicine.

In the language of our practical mechanics, the terms *machine*, *engine*, and *mill*, are uſed without a proper diſtinction of the claſſes of machinery to which they ſhould in ſtrictneſs be applied. All theſe denominations are alike the practical applications of the ſcience of mechanics, and conſiſt only of different combinations of the mechanical powers. Though the combinations and modifications which the ingenuity of mankind is conſtantly producing are endleſs, ſtill it is poſſible, by a proper claſſification, to arrange them under their proper terms, to avoid the confuſion which at preſent prevails amongſt thoſe of our ingenious countrymen, who have laboured to improve the arts dependent on mechanics, without troubling themſelves to fix upon the moſt preciſe language in which to expreſs their ideas. If we might preſume to decide upon a proper definition of theſe words, which has not hitherto been done, we ſhould adviſe that the term machine be uſed as generic, and applied to any mill, engine, inſtrument, or apparatus having moving parts. That machinery ſhould alſo be uſed as a general term, ſignifying the moving and operative parts of any machine or engine whatever, and its ſynonimous term mechaniſm be applied to the moſt delicate machinery, ſuch as the parts of watches and mathematical inſtruments, or to the moſt delicate parts of any other machine, as the machinery of a flour-mill, or ſawing-mill; the mechaniſm of a clock, watch, orrery, &c.

Let the term *engine* be reſtricted to ſuch machines as have ſome relation to hydraulics or pneumatics, or, in ſhort, where their operations depend upon, or actuate fluids; as a ſteam engine, a water engine, pumping engine, blowing engine, preſſure engine, and fire extinguiſhing engine.

Mill ſhould be applied to large and powerful compound machines, or ſyſtems of machines; including their firſt mover in the term; as a cotton mill, which contains a vaſt number of different machines, and alſo the water wheel, or ſteam engine, which actuates them all; ſo likewiſe, an iron mill, copper mill, rolling mill, grinding mill, logwood mill, worſted mill, &c. &c.

Corn mill, or *flour mill*, is, in ſome degree, an exception to our definition, becauſe in the early ſtages of ſociety it was the only mill in uſe, and hence the term became particularly attached to it; and any machine for grinding or reducing to powder is called a mill, as a coffee mill, bark mill, colour mill, malt mill, &c. though, in ſtrictneſs, theſe ſhould be called machines.

In this claſſification, we have ſtudied to infringe as little as poſſible upon the diſtinctions which have been made by cuſtom, and confirmed by the uſage of mechanics themſelves, though not invariably, for they have dividing engines, cutting engines, and many others which ſhould be machines.

MACHINERY.

The practical application of mechanics to the conſtruction of machinery, is a ſubject of the utmoſt importance to the welfare of our country, depending ſo materially as it does upon commerce, which is derived chiefly from our manufactures; and theſe owe the pre-eminence they have over other nations to the general introduction of machinery, which has taken place within theſe forty years, to abridge manual labour in every department, and in every trifling operation: it is to this ſource we muſt look for the increaſe of property of every deſcription, as the introduction of every machine is a real creation of all the work it will perform, without the addition of farther increaſe of human labour. An idea is very generally entertained, that machinery is prejudicial to the intereſt of mankind, as far as it tends to diminiſh the value of that labour by which the lower claſſes of ſociety can alone purchaſe the means of ſubſiſtence: this idea is, however, founded on error, as applied to any ſuppoſed injury ſociety in general can ſuſtain, though individuals whoſe labours are ſuperſeded by machines, will ſuffer inconvenience for a time, yet it is only for a time, and ſo long as they, or others more intelligent, ſhall diſcover a new channel for the exertion of their induſtry. As machines tend to increaſe the quantities of thoſe luxuries and neceſſaries of life which mankind are ſo anxious to obtain, it only requires that an equitable diviſion of theſe benefits ſhould be made to obviate every objection, and really improve the condition of all claſſes; a retroſpect of the laſt forty years ſhews the truth of this obſervation, for though ſo many machines have been employed in all trades and manufactures as probably to do more work than the whole population could do previous to that period, yet the value of human labour has, notwithſtanding, increaſed in the ſame proportion as other articles have advanced in price.

We ſhall, in this article, enter into ſome general obſervations upon the conſtruction of machinery, and particularly point out ſuch contrivances as ſeem applicable to other purpoſes than thoſe for which their inventors have employed them; and we ſhall give, as examples of practical machinery, a deſcription of the famous block machines at Portſmouth, which contain many new contrivances. We were unable to introduce theſe under the article Block, as the machines were not erected at the time that article was printed.

The grand object of all mechaniſm, or machinery, is to convey and modify the motion of the firſt mover of the machine, and communicate it in a proper manner to the ſubject to be operated upon: thus, the ſlow rotative motion of a water-wheel is, by the machinery of cranks, levers, and toothed wheels, converted into a rapid reciprocating motion for working ſawing machines, and the velocity of the motion is increaſed or diminiſhed, as the occaſion requires either great power or great ſpeed. In like manner, the rectilinear motion of the piſton rod of a ſteam engine is, by the machinery of parallel levers, working-beam, connecting-rod, crank and fly-wheel, converted into a rotative motion; and this motion can again, by the machinery of wheel-work, be adapted, either in velocity or power, to work grinding-ſtones, circular ſaws, threſhing-mills, and other ſimilar machines which require great velocity; or flatting mills, boring machines, raſping machines for logwood, lead-pipe drawing machines, &c. which require great power to give them motion, and are, therefore, performed with a leſs velocity. Machinery is, therefore, the organs by which motion is altered in its velocity, its period, and direction, and thus adapted to any purpoſe. All machinery will be found, upon minute inveſtigation, to be only modifications of the ſix mechanical powers: the greateſt number will be found to conſiſt chiefly of parts which have a motion of rotation round fixed axes, and derive all their energy from levers virtually contained in them: thus the pullies, wheel and axle, are only modifications of the lever, and the ſcrew is compounded of the lever with a variety of the inclined plane or wedge, ſo that the number of mechanical powers may be reduced to two, which aſſume an infinite variety of forms and motions. The theory and manner of calculating their effects will be found under Mechanics.

In contriving any machinery, the engineer ſhould always remember that nothing contributes more to the perfection of a machine, eſpecially if it is maſſive and ponderous, than great uniformity of motion. Every irregularity of motion waſtes ſome of the impelling power; and it is only the greateſt of the varying velocity which is equal to that which the machine would acquire if moving uniformly throughout; for while the motion accelerates, the impelling force is greater than what balances the reſiſtance then actually oppoſed to it, and the velocity is leſs than what the machine would acquire if moving uniformly; and when the machine attains its greateſt velocity, it attains it becauſe the power is then not acting againſt the whole reſiſtance. In both of theſe ſituations, therefore, the performance of the machine is leſs than if the power and reſiſtance conſtantly bore the ſame relation to each other, in which caſe it would move uniformly.

Every attention ſhould, therefore, be given to this, and we ſhould endeavour to remove all cauſe of irregularity through the whole machine. There are continual returns of ſtrains and jolts from the inertia of the different parts acting in oppoſite direction. Although the whole momenta may always balance each other, yet the general motion is hobbling, and the points of ſupport are ſtrained. A great engine, ſo conſtructed, commonly cauſes the building to tremble; but when uniform motion pervades the whole machine, the inertia of each part tends to preſerve this uniformity, and all goes ſmoothly. It is alſo deſerving of remark, that when the communications are ſo contrived, that the uniform motion of one part produces uniform motion to the next, the preſſures at the communicating points remain conſtant or invariable. Now the accompliſhing of this is generally within the reach of mechanics, and the engineer ſhould adapt his machinery to the particular caſe before him.

In the machinery for modifying and adapting a rotatory motion, the firſt which preſents itſelf is the communication by means of toothed wheels acting on each other. This is the moſt general method in machinery, becauſe it tranſmits the motion with certainty and accuracy, and if the teeth are properly formed, wheels, perhaps, conſume leſs force in friction than any other method; but this is a ſubject underſtood by few mechanics. In the treatiſes on the conſtruction of mills, and other works of this kind, are many inſtructions for the formation of the teeth of wheels, and almoſt every noted millwright has his own noſtrums; but they are moſt of them defective in principle, or at leaſt they are only correct in certain caſes, which have by experiment or theory been determined, and are extremely fallacious when applied indifferently for all caſes, as is the millwright's cuſtom. An inveſtigation of this ſubject, as applied to delicate mechaniſm, where accuracy rather than ſtrength is the object, will be found in our article Clock *Work*, and we propoſe to give ſome further applications of thoſe principles to wheels of large dimenſions under Mill *Work*.

In the formation of the teeth of wheels, a ſmall deviation from the perfect form is not, perhaps, of very great importance, except in caſes where a very large wheel drives a very ſmall one, a caſe the judicious engineer ſhould always avoid: the grand point to be attended to, is to adopt ſuch a conſtruction as will inſure all the teeth of a wheel being preciſely equal, and to make as great a number of them as the ſtrength will admit. This will cauſe ſeveral teeth to be in action at once, and make the communication of the motion extremely ſmooth and uniform. To obtain ſtrength in the cogs when they are made fine, the width or thickneſs of the wheel muſt be increaſed; and this is one of the greateſt practical improvements which has been made in machinery for theſe laſt twenty years. Formerly the beſt engineers, ſuch as Smeaton, directed the teeth of large cog-wheels to be four and five inches diſtant from each other, or *pitch*, as the millwrights term it. Such wheels always act unequally upon each other in conſequence of the point of contact of the large cogs conſtantly altering its poſition, becoming alternately nearer or farther from the centre of one or other of the wheels; and this, tending to increaſe the acting radius of one, whilſt it diminiſhes the other, cauſes their velocity and powers to vary at every cog that paſſes by, and the machine works by ſtarts and jerks. The wheel-work of modern machinery is conſtructed with fine cogs, ſeldom more than one and a half or two inches pitch, and as much length of cog, or breadth of the wheel, as will make them ſufficiently ſtrong. We have ſeen ſome wheels in a large cotton mill which bore a ſtrain equal to thirty horſes' power, in which they were nine and twelve inches broad upon the face. Cog-wheels are found to work moſt ſmoothly when the teeth of the large wheel are made of hard wood, and the teeth of the ſmall one made of caſt iron, the acting ſurfaces being dreſſed or filed ſmooth and to the true figure. A mechanic, in contriving any machinery, ſhould always bear in mind, that where he introduces cog-wheels, they ſhould be as large in their diameters as is conſiſtent with other circumſtances, becauſe this allows the teeth to be made finer in proportion to the power they are to bear, than if they were of ſmaller radii; and the teeth, therefore, nearer the centre: it alſo occaſions leſs preſſure or drift upon the centre, and the wear of the whole will be equable. Another circumſtance is worth notice, and ſhould always be attended to, where it will not interfere with more important conſiderations; this is, the direction in which any force is given to, and taken from, any piece of wheel-work: ſuppoſe, for inſtance, a water-wheel turning its axis, upon which is fixed a cog-wheel to give motion to a ſecond wheel, for the purpoſe of driving any machinery; now if this ſecond cog-wheel is applied on that ſide of the firſt cog-wheel which is aſcending, it will be oppoſite to that ſide of the wheel which is loaded with water, and is conſequently deſcending. In this ſtate the gudgeons of the water-wheel will have to bear (in ſome caſes) double the ſtrain of the power of the machine; becauſe the power, which is the weight of the water, is applied on one ſide the centre of the wheel, and is taken off by turning the ſecond cog-wheel on the other ſide: the centre, or fulcrum, therefore, bears the whole power, and alſo the re-action to that power, in addition to the weight of its own parts; in the ſame manner as the fulcrum of a ſteelyard or balance beam bears the whole of the weight ſuſpended from either end, and its own weight alſo. On the other hand, ſuppoſe the ſecond wheel applied on the deſcending ſide of the water wheel, this being on the ſame ſide of the centre, the preſſure thereon will be far leſs than the power of the machine. In ſome caſes (but not in a water-wheel), by the proper arrangement of the wheel-work, the power may be made to operate to lift the centres, and thus in part relieve them from the weight of the wheel, ſo as actually to diminiſh the preſſure of friction of the pivots, when, by a contrary application, it would have increaſed it in the ſame degree. Similar advantages will attend the precaution of adapting the poſitions of different wheels upon their ſhafts to the different weights or ſtrains they have to bear, ſo that the gudgeons at the two ends of any ſhaft may have an equal drift or preſſure upon them. This will cauſe them to wear equally, and to have leſs friction, becauſe they may be made ſmaller than where no ſuch care is taken, ſtill having ſufficient ſtrength. It is accompliſhed by conſidering the drift or preſſure upon the centre of every wheel upon any axis, and placing the two gudgeons or pivots of the axis at a diſtance from each of the wheels, proportionate to the drift upon its centre. Thus, ſuppoſe a ſhaft has a cog-wheel fixed upon it, and a ſmall wheel or pinion alſo fixed upon it at ſome diſtance from the wheel, the power is given to the axis by wheel-work operating upon the teeth of the pinion, and the re-action to this power is given by ſome machinery which the teeth of the large wheel actuates. In this caſe the drift on the centre of the pinion will be very conſiderable, becauſe the power is applied near the centre of the axis; but the wheel tranſmitting the power at a greater radius, will, perhaps, have much leſs drift on its centre (the proportion depending in ſome degree upon the direction in which the power and re-action are applied, as ſtated in our laſt obſervation): if this is the caſe, the gudgeon at that end of the ſhaft, where the pinion is placed, ſhould be lengthened out, ſo as to give the bearing point at a greater diſtance from it than the wheel, which ſhould have its gudgeon placed much nearer to it, becauſe leſs ſtrain is to be borne. By this means the drift upon the two ends of the ſhaft will be equally divided between them: and though this proportion of the centre cannot be always accompliſhed without inconvenience, the engineer ſhould always have it in view; and then, where it is not practicable, he ſhould attain the ſame end, by apportioning the ſtrength or diameter of the gudgeons to the relative ſtrains they have to bear.

An endleſs belt or ſtrap is a very general method of tranſmitting rotatory motion: it is uſually employed in caſes where a very quick motion is to be created, and the re-action to be overcome is nearly equable. In ſuch caſes it has the advantage of wheel-work from its ſimplicity and the eaſe of its motion. Some curious properties belong to the endleſs ſtrap, *viz.* that the pulley or rigger it works upon muſt be largeſt in the middle, that is, the diameter muſt be greater in the middle of the pulley than at the edges, becauſe the ſtrap always rides on to the largeſt diameter of the pulley, and if this is not in the centre it will ſlip off at one ſide. It is not eaſy to give any ſatisfactory explanation of this fact, nor of another, that if, by accident, one of the pullies is ſtopped while the ſtrap is urged round by the motion of the other, it inſtantly flies off its pulley, unleſs the edge of the pulley ſhould be much wider than the ſtrap. This property is a great recommendation of it for ſome purpoſes, ſuch as threſhing mills, flour-dreſſing machines, lathes, cotton machines, &c. where any thing accidentally ſtopping the machines would deſtroy them if driven by wheel-work, but the ſtrap ſlips round, and very ſoon comes off, ſo as to avoid all further danger. Belts of *girt-web*, ſuch as are uſed for ſaddle girts, are ſometimes uſed inſtead of leather ſtraps, though theſe are undoubtedly preferable. The ſtrap ſhould be dreſſed to an equal thickneſs and breadth throughout, and the ends very neatly joined; that is, of the ſame thickneſs there as at every other part. It is ſometimes done by ſewing, but the beſt method is by gluing them together, with a glue compounded of Iriſh glue, iſinglaſs, ale grounds, and boiled linſeed oil. The two ends being tapered away and overlapped are united with this cement, and will be as flexible as any other part, but ſo ſtrong that it will tear to pieces in any part rather than at the joint. A tool for equalizing the thickneſs and breadth of the ſtraps for belts is deſcribed in the Tranſactions of the Society of Arts, vol. xxviii. p. 192, invented by Mr. Aubrey. They will by this means be rendered very correct, for nothing can be more unpleaſant in machinery than the joint and thick places in the endleſs ſtraps jerking over the riggers, and cauſing a violent drift upon the centres every time by the increaſed tenſion of the ſtrap.

A mechanic, in calculating any extenſive piece of machinery which is to depend upon ſtraps for the communication of its motions, particularly if they are of great length to convey their motion to a conſiderable diſtance, and have much ſtrain upon them, ſhould always conſider that ſuch machinery will loſe ſome of its velocity; that the wheels, which are turned by ſtraps, will never make quite ſo many revolutions as they ought to do from a calculation of their diameters. This is generally ſuppoſed to ariſe from the ſtrap ſlipping, in ſome degree, upon the ſurface of the wheels it paſſes over, but we are inclined to ſuſpect that it ariſes from another cauſe which has not been inveſtigated, *viz.* the elaſticity of the ſtrap: for inſtance, ſuppoſe that the diſtance between two wheels connected by a ſtrap is ten feet, and that the ſtrain upon the ſtrap is ſuch as to ſtretch or extend it two inches in that length on the ſide which bears the ſtrain (called by mechanics the leading ſide), on the other, or returning ſide, there will be no ſtrain, and therefore the ſtrap will return to its original length. In ſuch a caſe the wheel which is driven will loſe in its motion two inches in every ten feet, becauſe the ſtrap gives out that quantity in leading to the wheel, but takes it up again in returning, as ſoon as the ſtrain is removed from it.

Small machines are ſometimes turned by a catgut band, the ends of which are united by a ſmall ſteel hook and eye, the hook being faſtened at one end and the eyes at the other. They are made with tubes, for the reception of the ends of the band, which are tapped with a ſcrew withinſide, and the band being tapered and ſcrewed into the tube holds very faſt. But to prevent it drawing out, a ſmall quantity of roſin ſhould be applied to the end of the band which projects through the tube, and a hot wire being touched to it ſinges and hardens the end, that it will never draw out of the tube. This method is conſtantly uſed in ſmall lathes, and works very neatly. The pullies for a catgut-band ſhould always be cut with a ſharp angular groove, for the reception of the band, and it ſhould not touch the bottom of it, or it will be liable to ſlip. For the ſame reaſon, the pullies are beſt made of wood, becauſe metals ſoon acquire a poliſh, which prevent the band holding firmly upon it. The wood ſhould be cut with its grain acroſs the direction of the band, that every part of the circumference may be of a ſimilar texture.

Endleſs chains are ſometimes uſed to communicate motion of wheels, and frequently cogs are formed on the wheels to be received into the links of the chains. This method is very practicable on particular occaſions, and though it has not advantages to put it in competition with cog-wheels acting upon each other when they can be applied, it is in many inſtances a valuable reſource to the engineer to convey motion to ſome diſtance when it requires to be accurate, and where it would injure the operation of the machine if any motion was loſt by the ſlipping of bands. In making ſuch chains the greateſt care is neceſſary to have all the links preciſely of one length, and the cogs very accurately fitted to them, or a great friction will be cauſed by the cogs forcing themſelves into ſpaces not exactly ſituated to receive them. The beſt way is to make the links in the manner of watch or clock chains, with iron plates, and holes drilled through them at equal diſtances, to receive croſs pins upon which the cogs are to act. By this means the lengths may be made far more accurately than by bending the iron in the manner of common chain links.

Mr. Nicholſon has deſcribed a ſpinning-wheel for children, at a charity-ſchool, in which a large horizontal wheel, with a ſlip of buff leather glued on its upper ſurface near the outer edge, drove twelve ſpindles, at which the ſame number of children ſat.

The ſpindles had each a ſmall roller, likewiſe faced with leather, and were capable, by an eaſy and inſtantaneous motion, of being thrown in contact with the large wheel at pleaſure; each child, therefore, could throw her own part of the apparatus into work, or cauſe it to ſtop as often or as long as ſhe pleaſed.

The winding bobbins for yarn at the cotton mills operate on the ſame ſimple and elegant principles, which poſſeſſes the advantages of drawing the thread with an equal velocity, whatever may be the quantity of the bobbins, and cannot break it. The ſame mode of communication has been adopted in large work by Mr. Taylor, of Southampton, in his ſaw mills. In this the wheels acted upon each other by the contact of the end grain of wood inſtead of cogs. The whole made very little noiſe and wore very well: it was in uſe nearly twenty years. There is of conſequence a contrivance to make the wheels bear firm againſt each other, either by wedges at the ſocket or by levers. This principle and method of tranſmitting mechanic power certainly deſerve attention; particularly as the cuſtomary mode by means of teeth requires much ſkill and care in the execution; and after all wants frequent repair. We have ſeen it applied to a threſhing machine, a ſmall wheel on the threſhing drum being applied in contact with the large wheel which gave motion to it, and a preſſure ſufficient to make it turn the machine was given by loading the ſocket for the ſpindle of the drum with a conſiderable weight. The ſame principle is capable of communicating motion with great accuracy when no force is required, as will be ſeen on a peruſal of Mr. Troughton's ingenious method of dividing aſtronomical inſtruments. See GRADUATION.

The conſtruction of bearings, pivots, gudgeons, or centres, of ſpindles, as they are indifferently termed, is a moſt important point; theſe parts being the principal ſeats of that friction which is the deſtruction of all machinery. Pivots are always made of iron or ſteel, both becauſe theſe ſubſtances are better adapted for rubbing ſurfaces, and that their ſtrength admits the pivot being as ſmall as poſſible; the bearing, or bed to receive the gudgeons or pivots, ſhould be of a ſofter metal, as braſs, tin, or zinc, and kept well ſupplied with oil when at work. Hardened ſteel is a moſt admirable ſubſtance for pivots, which have a great ſtrain to bear, and a rapid motion. The bearing or bed may alſo be made of the ſame material, and is the only inſtance where two bodies, having friction againſt each other, can with propriety be made of the ſame ſubſtance: for it is found, that where iron or ſoft ſteel ſurfaces are worked with a friction againſt parts of the ſame ſubſtances, the friction and abraſion are far greater than when a ſofter material, as braſs, tin, hard wood, ivory, horn, &c. is uſed. The great difficulty of making hard ſteel pivots to ſpindles is the only reaſon they are not generally uſed; but there are ſome caſes, in which nothing elſe can be employed: where ſteadineſs and accuracy of motion are required, and great velocity at the ſame time. To obtain this accuracy, it is neceſſary that the pivot ſhould be fitted, and kept in accurate contact with the interior ſurface of its ſocket or pivot-hole, and this will preſent a ſufficient acceſs of oil, to prevent any other ſpindle, than one of hardened ſteel, from burning or heating by the friction, when in rapid motion; and the expanſion occaſioned by this heat increaſes the preſſure and the friction, till the pivot becomes fixed in its ſocket, and will rather twiſt off than turn round in it. The ſpindle for a turning lathe muſt always be of hard ſteel; and even then, a failure of the ſupply of oil for a moment, will cauſe it to burn into the collar. Circular ſaw-ſpindles are frequently burnt in the ſame manner; their motion being very quick.

The beſt form of a gudgeon or pivot for a ſpindle, is that of a cylinder, with a flat ſhoulder, to prevent it from ſhifting its poſition endways. This form will bear moſt fairly and ſteadily; but it is neceſſary that the ſocket, or braſs which contains the pivot, ſhould be made in two halves, and put together with ſcrews, that the halves may be ſcrewed cloſer as the ſocket enlarges by wearing: but as this is only an imperfect method, becauſe the pivot can never fit accurately after having been worn, a conical form is uſed for the pivots of axles requiring great accuracy, as theſe may be always made to fill their ſockets, by preſſing the cone farther into its ſocket. The cone is uſed in many turning lathes, whilſt others are made very nearly cylindrical, with a ſhoulder; and as the collar is of hard ſteel, they do not wear in any ſenſible degree. Their advantage over the cone is, that they have no drift endways upon the oppoſite centre, as the cone has; though this is ſo ſlight in an acute cone, as to be of no importance in ſmall machinery. In heavy works, ſuch as the gudgeons of water-wheels, a conical figure would be highly improper, and has no advantage to recommend it; as ſuch gudgeons ſeldom have any braſs ſcrewed down over them, their own weight being ſufficient to keep them down, and they always fit true as they wear away. The moſt accurate and ſimple of all pivots is that which is ſimilar to a piece of work, while turning in a lathe; the axis having a ſmall hole made in each end of it, and the ſupports formed by ſharp conical points, received into the holes; and one of them muſt be adjuſtable by a ſcrew, to make it always fit the length of the ſpindle. It is uſual to make the conical points on the ends of two ſcrews, either of which may then be adjuſted. The ſame thing may be accompliſhed by making conical points at the ends of the ſpindle, and forming the holes for its reception in ends of the two fixed ſcrews, which can at all times be ſcrewed up as the parts wear. It is the moſt perfect of all methods, but is not adapted to bear any great ſtrain, becauſe the ſcrews will get looſe, and all the objections to the conical ſpindle apply to it.

The pivot at the lower end of a vertical ſhaft, which has a great weight to ſuſtain, as in a heavy horſe-wheel, is very properly made of a hemiſpherical figure, and received into a proper cavity. A cylindrical pivot, having a flat end, is frequently uſed for large and heavy upright axes; but it is difficult to keep oil ſupplied to them, as the great weight preſſes it out from between the acting ſurfaces, and the gudgeon burns. To avoid this, ſome mechanics make a cleft acroſs the lower face of the gudgeon, exactly in the manner of a ſcrew-head. This getting full of oil, is conſtantly ſupplied to the acting ſurfaces.

We have ſeen an horizontal windmill, having a vertical axis 100 feet high, with ſails and wheels of immenſe weight, all bearing upon one pivot. This was with the greateſt difficulty kept in order; and it was neceſſary to keep a ſmall ſtream of cold water always running into a pan, which ſurrounded the gudgeon, to keep it cold. This method of watering, inſtead of oiling, a gudgeon is alſo uſed in paper-mills; but it cannot be recommended as a good method.

Friction-rollers are frequently uſed for ſupporting gudgeons, and, if made with great care, have the leaſt friction which can be conceived; but they are liable to get out of order, if not made with extreme accuracy. See MILL-*Work*.

A great number of machines depend upon reciprocating motions, ſuch as pump-mills, ſaw-mills, &c. Where the firſt mover has a circular motion, as a water-wheel, the reciprocating movement will be moſt conveniently produced by means of a crank; becauſe it commences the change of motion by degrees, and does not ſuddenly urge the parts into motion in a contrary direction; nor ſuddenly check the movement again, but effects both changes without violence. It is proper, in ſuch caſes, to regulate the motion of the firſt mover by a fly-wheel, otherwiſe the reſiſtance of the work, at the inſtant of the change of motion, is ſo ſmall, that the machine would accelerate in that period, and then be checked again. The ſame may be accompliſhed by having ſeveral of the reciprocating movements and theſe act alternately, that when one requires the moſt power, the others take the leaſt, ſo as to equalize the reſiſtance to the firſt mover, and make the motion uniform. All reciprocating machines labour under great diſadvantages, from the circumſtance that a great maſs of matter muſt be put in motion, and this motion deſtroyed again. Thus, in a ſingle pump forcing water through a great height of pipes, the column of water is, at every ſtroke the pump makes, put in rapid motion, which is wholly loſt during the return of the pump-bucket for another ſtroke, when freſh impetus muſt be given to the water: now by applying a double acting pump, or two or three pumps acting at intervals, and the water regulated by an air-veſſel, the motion will be very eaſy, becauſe the column of water will be in conſtant motion through the pipes, and the momentum once given to it will continue as long as the machine is at work, inſtead of requiring a repetition of it at every ſtroke.

In every machine, the action of the moving power is transferred to the working point, through the parts of the machinery, which are material, inert, and heavy; or, to deſcribe it more accurately, before the neceſſary force can be excited at the working point of the machine, the various connecting forces muſt be exerted in the different parts of the machine: and in order that the working point may follow out the impreſſion already made, all the connecting parts or limbs of the machine muſt be moved in different directions, and with different velocities. Force is neceſſary for thus changing the ſtate of all this matter, and frequently a very conſiderable force. Time muſt alſo elapſe before all this can be accompliſhed. This often conſumes, and really waſtes, a great part of the impelling power. Thus, in a crane worked by men walking in a wheel, it acquires motion by ſlow degrees; becauſe, in order to give ſufficient room for the action of the number of men or cattle that are neceſſary, a very capacious wheel muſt be employed, containing a great quantity of inert matter. All of this muſt be put in motion by a very moderate preponderance of the men: it accelerates ſlowly, and the load is raiſed. When it has attained the required height, all this matter, now in conſiderable motion, muſt be ſtopped. This cannot be done in an inſtant, with a jolt, which would be very inconvenient, and even hurtful: it is therefore brought to reſt gradually. This alſo conſumes time. Nay, the wheel muſt get a motion in the contrary direction, that the load may be lowered into the cart or lighter; and this can only be accompliſhed by degrees. Then the tackle muſt be lowered down again for another load, which alſo muſt be done gradually. All this waſtes a great deal both of time and force, and renders a walking-wheel a very improper form for the firſt mover of a crane, or any machine whoſe uſe requires ſuch frequent changes of motion. The ſame thing obtains, although in a lower degree, in the ſteam-engine, where the great beam and pump-rods, ſometimes weighing many tons, muſt be made to acquire a very briſk motion in oppoſite directions, twice in every working ſtroke. It operates in a greater or a leſs degree, in all engines which have a reciprocating motion in any of their parts. Pump-mills are of neceſſity ſubjected to this inconvenience. In the famous engine at Marly, about $\frac{12}{26}$ths of the whole moving power of ſome of the water-wheels is employed in giving a reciprocating motion to a ſet of rods and chains, which extend from the wheels to a ciſtern about three-fourths of a mile diſtant, where they work a ſet of pumps: thus the engine is, by ſuch injudicious conſtruction, a monument of magnificence, and the ſtruggle of ignorance with the unchangeable laws of nature. In machines, all the parts of which continue the direction of their motion unchanged, the inertia of a great maſs of matter does no harm; but, on the contrary, contributes to preſerve the ſteadineſs of the motion, in ſpite of ſmall inequalities of power or reſiſtance, or unavoidable irregularities of force in the interior part. But in all reciprocations, it is highly prejudicial to the performance; and, therefore, conſtructions which admit ſuch reciprocation without neceſſity, are avoided by all the intelligent engineers.

In many machines, but generally in ſmall works, what are called hearts, camms, ſnails, excentric wheels, &c. are a very excellent method of producing ſlight reciprocating movements to levers. From the rotatory motion of an axis, they have the great advantage of admitting any modification of the motion, to act ſuddenly or gradually, in either direction, at the pleaſure of the maker. This is done, by wheels of a particular form, faſtened upon an axis, and levers applied in contact with their circumferences, which receive a motion in proportion as the different radii of the wheels alter their lengths; and if, at any point of the motion, the lever is to be in a ſtate of reſt, the periphery of the wheel is, during that period, made a circular arc, and concentric with the axis. From the facility of producing any motion whatever by camms, it is an univerſal method, and applicable to all ſubjects; but ſtill has objections, which will induce the engineer to neglect it in thoſe inſtances, where any other movement will anſwer the ſame purpoſe. Theſe objections are the great friction, and wear of the camms, which ſoon unfits them for accurate motion: this may in ſome meaſure be obviated by applying rollers in the ends of the levers, to receive the contact of the camm. Another objection is, that the camm is unfit for producing a double motion, becauſe a ſpring or weight muſt be introduced to return the lever, and always keep it in contact with the camm. Now if this ſpring is only uſed to return the lever, it will operate very well; but if it is made ſo ſtrong as to effect any operation of the machine, the friction will be great, and be a ſerious objection to the uſe of camms.

The principles of theſe movements, and practical directions for conſtructing camms for any kind of movement, is fully explained in our article Diagonal *Motion*, which renders it unneceſſary to enlarge upon the ſubject in this place. Camms are uſed on a large ſcale in rolling-mills, for working the ſhears with which large iron bars are clipped into lengths. They are alſo employed in the machine for punching holes through the iron plates for boilers, weaving machines, &c.; and are in common uſe in the blowing machine uſed in iron forges; but it is a very injudicious application, and a common crank would be much better.

We once with great pleaſure contemplated a very complicated machine, in which were many reciprocating parts neceſſarily operating only whilſt moving in one direction; in the other, they had merely to return to repeat their operations. To produce this reciprocation, the inventor applied a crank, which was cauſed to revolve by the action of a pair of elliptical cog-wheels, each balanced on an axis paſſing through one of its foci. In this conſtruction, the motion of the driven wheel and the crank it carried, was exceedingly variable, but by equal increments of alternate acceleration and retardation. Thus when the long radius of the firſt wheel was operating, it met the ſhorteſt radius of the other, therefore giving it and alſo the crank a rapid motion: in this ſtate, the crank was returning to repeat its ſtroke, and with a quick ſtroke; but by the time it had completed half a revolution, the action was reverſed, the ſhort radius of the firſt wheel acting upon the long radius of the ſecond, which was therefore with its crank at the ſloweſt point of its movement: but the decreaſe of the motion, from the quickeſt to the ſloweſt point of its revolution, being effected by equal increments, gave no ſhock to the machinery. The crank was of courſe, during the ſlow half of its movement, performing its work; and in the quick period, returning to fetch its ſtroke. By this judicious arrangement, the reſiſtance to the firſt movement was very nearly equable: for when it had work to perform, the wheel-work gained a power upon the working point; but in returning, it cauſed it to urge the working point with ſuch an increaſed velocity, as in ſome degree counterbalanced the diminiſhed reſiſtance: but in this, no loſs was occaſioned, becauſe this increaſed velocity ſhortened the period of inaction haſtening the return to a ſituation for repeating its operation.

Theſe elliptical wheels are, in the hands of an able mechanic, a very uſeful contrivance, but they have not been much uſed in machinery, from the difficulties of forming their teeth with preciſion. In the Cometarium, (ſee that article,) they are introduced to repreſent the elliptic motions of comets, and we have ſeen two inſtances of their being uſed in large machines, where they operated with as much facility as circular wheels. It is to be obſerved, that a ſmall excentricity of the ellipſe, conſequently a ſlight deviation from the circular figure, will produce a great inequality of their motion, becauſe the increaſe of the acting radius of one wheel, is attended with a correſpondent decreaſe of the other, ſo that to produce almoſt any differences of motion which can be required in practice, the excentricity of the wheels will be ſuch as can eaſily be accompliſhed, and as will work with each other ſmoothly and accurately. When heavy ſtampers are to be raiſed in order to drop on the matter to be pounded, the wipers, by which they are lifted, ſhould be made of ſuch a form that the ſtamper may be raiſed by an uniform preſſure, or with a motion almoſt imperceptible at firſt. If this is not attended to, and the wiper is only a pin ſticking out from the axis, the ſtamper is forced into motion at once. This occaſions a violent jolt to the machine, and great ſtrains on its moving parts and their points of ſupport: whereas, when they are gradually lifted at firſt, the inequality of deſultory motion is never felt at the impelled point of the machine.

We have ſeen piſtons of pumps moved by means of a double rack on the piſton rod: a half wheel takes hold of one rack and raiſes it to the required height. The moment the half wheel has quitted that ſide of the rack, it lays hold of the other ſide and forces the piſton down again. This has been propoſed as a great improvement, by correcting the unequable motion of the piſton, moved in the common way by a crank motion; but it occaſions ſuch abrupt changes of motion, that the machine is ſhaken by jolts. Indeed, if the movements were accurately executed, the machine would be ſoon ſhaken to pieces, if the parts did not give way by bending and yielding. Accordingly we have always obſerved that this motion ſoon failed, and was changed for one that was more ſmooth: a judicious engineer will avoid all ſuch ſudden changes of motion, eſpecially in any ponderous part of a machine.

When ſeveral ſtampers, piſtons, or other reciprocal movers are to be raiſed and depreſſed, common ſenſe teaches us to diſtribute their times of action in an uniform manner, ſo that the machine may always be equally loaded with work. When this is done, and the obſervations in the preceding paragraph attended to, the machine may be made to move, almoſt as ſmoothly as if there were no reciprocations in it. Nothing ſhews the ingenuity of the engineer more, than the artful, yet ſimple and effectual contrivances, for obviating thoſe difficulties that unavoidably ariſe from the very nature of the work to be performed by the machine, or in the power employed to actuate it.

In the contrivance of machinery, an engineer muſt not be tied down by too many inviolable maxims, becauſe thoſe contrivances which are the moſt improper in ſome ſituations will be the beſt of all in other caſes. There is great room for ingenuity and good judgment in the management of the moving power, when it is ſuch as cannot immediately produce the kind of motion required for effecting the purpoſe. We mentioned the converſion of the continued rotation of an axis into the reciprocating motion of a piſton, and the improvement which was thought to have been made on the common and obvious contrivance of a crank, by ſubſtituting a double rack on the piſton rod, and the inconvenience ariſing from the jolts occaſioned by this change. We have been informed of a great forge, where the engineer, in order to avoid the ſame inconvenience ariſing from the abrupt motion given to the great ſledge hammer of ſeven hundred weight, reſiſting with a five-fold momentum, formed the wipers for lifting it into ſpirals, which communicated motion to the hammer with ſcarcely any jolts whatever: but the reſult was, that the hammer roſe no higher than it had been raiſed in contact with the wiper, and then fell on the iron bloom, with very little effect. The cauſe of its inefficiency was not gueſſed at; but it was removed, and wipers of the common form were put in place of the ſpirals.

In this operation the rapid motion of the hammer is abſolutely neceſſary; it is not enough to lift it up, it muſt be raiſed up ſo as to fly higher than the wiper lifts it, and to ſtrike with great force the ſtrong oaken ſpring which is placed in its way. It compreſſes this ſpring, and is reflected by it with a conſiderable velocity, ſo as to hit the iron as if it had fallen from a great height: had it been allowed to fly to that height it would have fallen upon the iron with ſomewhat more force (becauſe no oaken ſpring is perfectly elaſtic); but this would have required more than twice the time.

In employing a power which of neceſſity reciprocates, to drive machinery which requires a continuous motion (as in applying the ſteam engine to a cotton or corn grinding mill), there alſo occur great difficulties. The neceſſity of reciprocation in the firſt mover waſtes much power, becauſe the inſtrument which communicates ſuch an enormous force muſt be extremely ſtrong, and be well ſupported. The impelling power is waſted in imparting, and afterwards deſtroying a vaſt quantity of motion in the working beam. The ſkilful engineer will attend to this, and do his utmoſt to procure the neceſſary ſtrength of this lever, without making it a vaſt load of inert matter. He will alſo remark, that all the ſtrains on it, and on its ſupports, are changing their directions in every ſtroke. This requires particular attention to the manner of ſupporting it: if we obſerve the old ſteam engines which have been long erected, we ſee that they have uniformly ſhaken the building to pieces. This has been owing to the ignorance or inattention of the engineer in this particular; they are much more judiciouſly erected now, experience having taught the moſt ignorant that no building can withſtand their deſultory and oppoſite jolts, and that the great movements muſt be ſupported by a frame work of wood or iron, independent of the building of maſonry which contains it. The gudgeons of a water wheel ſhould never reſt on the wall of the building; it ſhakes it, and if ſet to work ſoon after the building has been erected, it prevents the mortar from taking firm bond, perhaps by ſhattering the calcareous cryſtals as they form.

When the engineer is obliged to reſt the gudgeons in this way, they ſhould be ſupported by a block of oak laid a little hollow: this ſoftens all tremors, like the ſprings of a wheel carriage. This practice would be very ſerviceable in many other parts of the conſtruction. It will frequently conduce to the good performance of an engine, to make the action of the reſiſting work, unequable, and accommodated to the inequalities of the impelling power. This will produce a more uniform motion in machines, in which the momentum of inertia is inconſiderable. There are ſome beautiful ſpecimens of this kind of adjuſtment in the mechaniſm of animal bodies.

In many compound machines it is of conſequence to be able to detach part of the movements while the others continue in motion. Thus in cotton-ſpinning machines, it is neceſſary to be able to caſt off or ſtop any ſpindle at pleaſure, without diſturbing the reſt; and in a large mill containing many machines, it is eſſential that any one may be releaſed without interruption to the firſt mover. Such contrivances are called coupling or clutch-boxes: they are effected in various ways, ſome of which are detailed under COUPLING-BOX. But we wiſh here to deſcribe a recent improvement, very generally adopted in cotton and woollen mills; the object of which is to avoid a jerk being given to any machine when it is put in action, from its being ſuddenly urged from a ſtate of reſt to a ſtate of motion: for if the movement is to be rapid, nothing can be more deſtructive to the machine than the violence of the ſhock it receives from the common clutch-box. To avoid this, the arm which gives motion to the machine when the clutch of the running ſpindle is engaged with it, is not fixed faſt upon the ſpindle, but is made in two halves ſcrewed together upon a circular part of the ſpindle, and pinched upon it ſo faſt by the ſcrews, that it will have ſufficient friction to turn the machine round in the ordinary courſe of its work, but ſlips round upon the ſpindle, if the reſiſtance is greater than this friction, which thus becomes the meaſure of the power dealt out to the machine.

Suppoſe a machine of this kind at reſt, the clutch is turned by the firſt mover with a conſiderable velocity, and is ſuddenly connected with the arm above deſcribed: now it requires ſome time (independent of any reſiſtance or work of the machine) to put its parts in motion. In this time the arm ſlips round upon the ſpindle, but the friction acts conſtantly, and with an equable force upon the machine to turn it round. It commences its motion, which gradually accelerates, until it arrives at the ſame velocity as the driving ſpindle, and then the ſlipping of the box ceaſes, and the machine proceeds in an uniform manner: ſtill the box is a very uſeful proviſion in caſe of any accident happening to the machine to ſtop it; by any thing getting into its movements: the box then ſlips round without breaking the works. All machinery, which is expoſed to the chance of great violence, ſhould be provided with ſome equivalent contrivance, which permits the movement to ſlip when the machine is overloaded and would otherwiſe be broken. An inſtance of this will be ſeen in the DREDGING *Engine;* ſee that article. The ſame effect may be produced by conical wheels fitting into each other, in the manner of a valve and its ſeat. One of them being fixed to each ſpindle, will, when they are jambed into each other, communicate the motion, but permits it to ſlip if overloaded. A very ingenious application of this will be found, in the mortiſing machine of the block machines at Portſmouth (ſee MACHINERY *for manufacturing Ships' Blocks*), and another judicious application of it under LOGWOOD *Mill.*

Many other contrivances are in uſe for detaching or uniting motions at pleaſure. In cog-wheels, the ſupports for the gudgeons are ſometimes fitted up ſo as to be moveable, that the wheels can be ſeparated to ſuch a diſtance as to relieve each other's teeth. At other times one of the wheels is fitted on a round part of its axis, and united with it at pleaſure by a clutch-box. Thus the wheels are always in motion, but one of them can be detached at pleaſure from its axis, on which it ſlips freely. Bevelled cog-wheels are eaſily diſengaged, by ſuffering the axis of one to move a little endways, and then their teeth are ſeparated.

Wheels turned by ſtraps are readily connected, or caſt off, by removing the ſtrap, but this is not eaſily done while the wheels are in motion; though ſome dextrous workmen are able to put on the ſtraps when the wheels are going; but it is attended with much difficulty, and great danger, if the motion is quick, of catching the fingers in the ſtrap. We have known an inſtance of a man's arm being torn away at the ſhoulder, by careleſſneſs in performing this operation.

For diſengaging the motion of a ſtrap, the contrivance called the live and dead pulley is very ingenious: it conſiſts of two pullies placed cloſe together upon any axis which is to receive a circular motion. The endleſs ſtrap or band, by encompaſſing one of theſe pullies, gives it a conſtant rotatory motion. Now one of them being fixed faſt upon the ſpindle, and the other ſlipping freely round upon it, gives the means of turning or diſcontinuing the motion of the ſpindle at pleaſure, by ſhifting the ſtrap either upon the live or dead pulley, which, as they are exactly of the ſame ſize, and cloſe to each other upon the ſpindle, is eaſily done. The live pulley is that which is fixed to its axis, ſo called from its cauſing life or motion to the ſpindle, and the machinery appended to it. The dead or idle pulley is that which ſlips upon its ſpindle; therefore, when the ſtrap is cauſed to run upon it, it turns round without giving any motion to the ſpindle. This contrivance is extremely well adapted to give motion to ſmall machinery, from the ſimplicity of its conſtruction, and the facility with which it is put in motion or at reſt. It poſſeſſes alſo another great advantage, *viz.* it occaſions no ſudden ſhock to the machinery at firſt ſtarting, as it does not inſtantly communicate to it the full velocity. To illuſtrate this, ſuppoſe the ſtrap running upon the dead pulley, and the machine therefore at reſt, the leading ſide of the ſtrap is in general conducted through a notch in a piece of board which is fitted in a groove, ſo as to have liberty of ſliding in ſuch a manner that it may conduct the ſtrap to work upon either of the pullies; but this is not neceſſary nor always attended to, for the perſon who attends the machine may, by the ſlighteſt preſſure on the leading ſide ſtrap by his hand, cauſe it to ſhift upon the other pulley; but as this is not done inſtantly, it communicates the motion to the live pulley by degrees; for at firſt ſhifting, it begins upon a very narrow ſurface of the pulley, which is, therefore, urged into motion, but without violence to the machine, as the ſtrap at firſt ſlips partially upon the ſurface of the live pulley, and this, as we have before ſtated, cauſes the ſtrap to endeavour to eſcape from the pulley; but the attendant continues to preſs the ſtrap on the leading ſide, and force it to act upon the live pulley, which having attained its full velocity, and the ſtrap no longer ſlipping upon it, has no tendency to get off, unleſs the machine is overloaded, and then it will get off to the dead pulley. The live and dead pulley is very extenſively uſed in cotton machinery, and is a very excellent contrivance; the only objection to it being that the buſh in the centre of the idle pulley is liable to wear very looſe in a ſhort time. It is ſcarcely neceſſary to add, that the driving wheel for the ſtrap of the live and dead pulley muſt be as broad on its edge as both the live and dead pulley together; indeed, it is generally a long cylindrical drum, which receives many ſtraps for turning different machines.

A motion is frequently required in machinery, by which a wheel or axis is made to revolve in one direction for any required time, and then at pleaſure changed, ſo as to revolve in the other direction. Various means may be uſed for effecting this purpoſe. The moſt common is by means of two equal and ſimilar bevelled or contrate wheels, ſituated on the ſame axis, and their teeth towards each other. A third bevelled wheel is applied with its axis perpendicular to the former, and its teeth engaging at pleaſure with either of the two wheels, which, as they turn the ſame way round, and can be made to act at one or other of the ſides of the third wheel, ſo as to turn it in either direction, as it is engaged with either of the two wheels. This movement was applied by Mr. Smeaton to a machine he invented for drawing coals from coal-pits. In this the third wheel was a trundle, and could be, by a lever, made to work in the teeth of either of the cog-wheels which were mounted upon the axis of a water-wheel, and thus turned the trundle either way at pleaſure, to draw up or let down the baſkets or corves, which were ſuſpended from a drum upon the axis of the trundle. Some mechanics have conſtructed the contrivance in a different manner, by fitting the two wheels upon a circular part of their ſpindle, and ſuffering them to turn round freely upon it. Their teeth are always engaged with the teeth of the third wheel, and, therefore, they are always revolving in oppoſite directions, and either can at pleaſure be connected with the axis by a ſliding clutch-box, but which is not long enough to engage both at once. The axis can, by this means, be made to revolve in the direction of either wheel at pleaſure, by ſliding the clutch-box towards that wheel.

We have ſeen a very ingenious application of the live and dead pulley to this purpoſe, for a crane in a cotton mill, to take up and down the goods, work-people, &c. It was invented by Mr. Henry Strutt, and has been applied in his cotton mills at Belper, Derbyſhire. In this machine it was neceſſary to have a motion which could be turned either way at pleaſure, to draw up or let down the baſket; but the double wheel-work above deſcribed was evidently improper, from the ſudden jerk it would have given at the inſtant of changing the motion. It was effected in this manner: an axis which gave motion to the crane barrel, has two pair of live and dead pullies upon it, and alſo a brake wheel to ſtop the motion, which is ſituated between the two pair: an endleſs ſtrap is conducted to each pair, being turned by a long drum placed parallel to the axis of the pullies, and kept in conſtant motion by the mill. One of theſe endleſs ſtraps is croſſed between

between the drum and its pullies, but the other is not, therefore one pair of the live or dead pullies are always revolving in one direction, and the others are turning in an oppoſite way. Both ſtraps are conducted through guides fixed to a ſliding rail, by which the ſtraps can be ſhifted both at once, ſideways. When this rail is in a poſition that the ſtraps are both upon their dead pullies, the axis and brake wheel are at reſt, and in this poſition the rail has a tendency to remain, unleſs forced by hand. On moving the rail one way from the quieſcent point, one of the ſtraps is thrown on its live pulley, and the ſpindle turns with it, winding up the baſket. By moving the rail in the other direction beyond its quieſcent point, this ſtrap is ſhifted on to its dead pulley, and becomes inactive; but the other ſtrap operates on its live pulley, to turn the ſpindle in the oppoſite direction, and lets down the baſket. We ſhall deſcribe this very uſeful and curious machine in its place among the cotton machinery. See MANUFACTURE *of Cotton*.

Logwood raſping engines, ſcrew preſſes, and ſome other machines, require a motion to work them forwards to a certain extent, and then the direction is to be reverſed to draw them back, which requires but very little power to effect it. In this caſe the motion may be effected by a pair of cog-wheels turning each other, and thus communicating the motion for one direction in which it is to perform the work. A couple of pullies are fixed on the reſpective axes near the cog-wheels, and an endleſs ſtrap connects them, but the ſtrap is ſo long, that when the cog-wheels are in gear, the ſtrap hangs ſlack, and does not operate: but to reverſe the movement, the ſockets for one of the gudgeons of the driving ſpindle or axis is made to ſhift, that the diſtance between the centre of the two wheels may be increaſed, ſo as to diſengage the teeth of the wheels, and the ſtrap becomes tight, and turns the wheels back; but on bringing the wheels together again, the ſtrap becomes ſlack, and the wheels reſume their original courſe.

Screws are, of all the mechanical powers, the moſt frequently uſed in machines, though not always as moving parts, being chiefly introduced for uniting and retaining the parts. They are not ſo conſtantly employed as acting movements, on account of their friction, and the trouble of making them; they are, nevertheleſs, a very uſeful agent on many occaſions, and poſſeſs the advantage of accurately retaining any movement they make, and producing an extremely ſlow motion with eaſe, and, when it is required, with the moſt perfect accuracy. No engineer will employ ſcrews for a rapid motion, as their friction and great wear renders them unfit for ſuch ſituations. To the endleſs ſcrew acting on the teeth of cog-wheels, this objection does not apply ſo forcibly, becauſe the great number of teeth on which the ſcrew operates ſucceſſively, do not wear ſo faſt as the nut of a female ſcrew would under the ſame circumſtances, and the friction is far leſs, becauſe the ſcrew is not encloſed all round its thread. The endleſs ſcrew or worm is uſeful on many occaſions to obtain a ſlow motion, which it does in a very ſimple manner; but, for the purpoſe of obtaining a quick motion, it ſhould never be uſed, on account of the friction and conſequent wear. This is ſeen in the common roaſting jack.

In many ſituations in which moving ſcrews are uſed, the ſame effects may be produced in the moſt ſimple and convenient manner by Mr. Bramah's method of producing and applying a more conſiderable degree of power to all kinds of machinery requiring motion and force, than by any means at preſent practiſed for the purpoſe. This method, for which, on the 31ſt of March 1796, he obtained a patent, conſiſts in the application of water, or other denſe fluids, to various engines, ſo as, in ſome inſtances, to cauſe them to act with immenſe force; in others, to communicate the motion and powers of one part of a machine to ſome other part of the ſame machine; and laſtly, to communicate the motion and force of one machine to another, though removed to a great diſtance from each other, and where their local ſituations preclude the application of all other methods of connection. The principle of this invention is the ſame with the hydroſtatic paradox, but its various applications to uſeful purpoſes is due to Mr. Bramah. The ſimpleſt form is for a preſs, or machine, to raiſe an enormous weight to a ſmall height: a metallic cylinder ſufficiently ſtrong, and bored perfectly ſmooth and cylindrical, has a ſolid piſton fitted into it, which is made perfectly water tight, by leather packing round its edge, or other means uſed in hydraulic engines. The bottom of the cylinder muſt be made ſufficiently ſtrong, with the other parts of the ſurface, to reſiſt the greateſt ſtrain which can ever be applied to it. In the bottom of the cylinder is inſerted the end of a ſmall tube, the aperture of which communicates with the inſide of the cylinder, and introduces water or other fluids into it: the other end of the pipe communicates with a ſmall forcing pump, by which the water can be injected into the cylinder under its piſton: the pump has of courſe valves to prevent the return of the water. Now ſuppoſe the diameter of the cylinder to be twelve inches, and the diameter of the piſton of the ſmall pump or injector only one quarter of an inch, the proportion between the two ſurfaces or ends of the ſaid piſtons will be as 1 to 2304; and ſuppoſing the intermediate ſpace between them to be filled with water, or other denſe and incompreſſible fluids, any force applied to the ſmall piſton will operate upon the other in the above proportion, *viz.* as 1 to 2304. Suppoſe the ſmall piſton or injector to be forced down when in the act of forcing or injecting with a weight of 20 cwt. which can eaſily be done by means of a long lever, the piſton of the great cylinder would then be moved up, with a force equal to 20 cwt. multiplied by 2304. Thus is conſtructed a hydro-mechanical engine, whereby a weight amounting to 2304 tons can be raiſed by a ſimple lever, in much leſs time through equal ſpace, than could be done by any apparatus conſtructed on the known principles of mechanics, and it may be proper to obſerve, that the effect of all other mechanical combinations is counteracted by an accumulated complication of parts, which renders them incapable of being uſefully extended beyond a certain degree, but in machines acted upon, or conſtructed on this principle, every difficulty of this kind is obviated, and their power ſubject to no finite reſtraint. To prove this, it will be only neceſſary to remark, that the force of any machine acting upon this principle can be increaſed, *ad infinitum*, either by extending the proportion between the diameter of the injector and the great cylinder, or by applying greater power to the lever actuating the ſmall pump. On this principle very wonderful effects may be produced inſtantaneouſly, by means of compreſſed air. Suppoſe a large cylinder, furniſhed with a piſton in the ſame manner as before deſcribed, a globular veſſel is uſed, made of copper, iron, or other ſtrong material, capable of reſiſting immenſe force, ſimilar to thoſe uſed for air guns: it has a ſtrong tube of ſmall bore, in which is a ſtop-cock: one of the ends of this tube communicates with the great cylinder beneath its piſton, and the other end with the globe. Now ſuppoſe the great cylinder to be of the ſame diameter as that before deſcribed, and the ſmall tube equal to one quarter of an inch diameter, which is the ſame as the injecting pump before-mentioned for the preſs: then ſuppoſe that air is injected into the globe (by the common methods) till it preſſes againſt the cock with a force equal to 20 cwt. which can be done; the conſequence will be, that when the cock is opened, the piſton will be inſtantly moved in the great cylinder, with a power or force equal to 2304 tons, and it is obvious, as in the caſe before-mentioned, that any other unlimited degree of force may be acquired by machines or engines thus conſtructed. By the hydroſtatic principle, the power and motion of any machine may be transferred or communicated to another, let their diſtance and local ſituation be what they may. Suppoſe two ſmall tubes or cylinders, in the inſide of each of which is a piſton made water and air-tight, a tube may be conveyed under ground or otherwiſe, from the bottom of one cylinder to the other, to form a communication between them, notwithſtanding their diſtance be ever ſo great. Let this tube be filled with water, or other fluid, until it touches the bottom of the two piſtons; then, by depreſſing the piſton of one cylinder, the piſton of the other will be raiſed. The ſame effect will be produced, *vice verſâ;* thus bells may be rung, wheels turned, or other machinery put inviſibly in motion by a power being applied to either cylinder.

By theſe means, it is obvious, that moſt commodious machines of prodigious power, and ſuſceptible of the greateſt ſtrength, may readily be formed. If the ſame multiplication of power be attempted by toothed-wheel pinions and racks, it is ſcarcely poſſible to give ſtrength enough to the teeth of the racks, and the machines become very cumberſome, and of great expence. But Mr. Bramah's machine may be made abundantly ſtrong in very ſmall compaſs. It only requires very accurate execution. The hydroſtatic principle on which it depends has been well known for nearly two centuries, and it is a matter of ſurpriſe that it has never before been applied to any uſeful practical purpoſe.

The application which Mr. Bramah has made of this truly valuable principle is very general: it was firſt applied for preſſes inſtead of large ſcrews, for which purpoſe it is greatly ſuperior in every reſpect. Preſſes being generally moved by the ſtrength of men alone, the ſaving of power becomes a great object; and this it accompliſhes, having no proportion of the friction of the ſcrew, and immenſely greater power. In a ſcrew-preſs, it requires nearly as much labour to unſcrew as to ſcrew it up, an evidence of the enormous friction of a ſcrew, when acting againſt a great preſſure: but the hydroſtatic-preſs only requires a cock to be opened to let out the water from beneath the piſton, which then deſcends quickly, by its own gravity, or the elaſticity of the ſubſtances under the preſſure. But the greateſt convenience of the hydroſtatic principle is, that its power can ſo eaſily be tranſmitted to any diſtance, and in any direction, by means of pipes conducted along in ſituations where all other means of conveying the motion would be complicated, and expenſive in the extreme. Thus, in a large paper-mill, an injecting-pump may be kept in conſtant action by the water-mill, or ſteam-engine, and inject water into an air-veſſel, from which pipes are conducted to preſſes in all parts of the mill, and by ſimply opening a cock at any preſs, any required preſſure will be inſtantly given by the elaſticity of the confined air operating on the enlarged ſurface of the piſton of any preſs. The air-veſſel has, of courſe, a ſafety-valve, to allow the eſcape of the water when the preſſure becomes ſo great as to endanger the rupture of any of the veſſels; for it is to be obſerved, that the power of this principle is irreſiſtible, when the pump is worked by a mill, and will burſt any veſſels, without the leaſt appearance of ſtrain on the moving parts of the pump.

In Mr. Bramah's extenſive work-ſhops at Pimlico, and another at Mill-Bank, London, the ſteam-engines which turn the lathes, boring-machines, planing-machines, &c. work a ſmall injecting-pump, as above-mentioned, and ſmall copper pipes are laid to every part of the works, and by cocks admitting it into various cylinders, many powerful operations are performed: it works an immenſe preſs for bending ſtrong iron bars, or breaking caſt-iron for the foundery. It moves the carriage of the planing-engine; and he has brought the methods of packing the cylinders to ſuch perfection, that they are employed to make the moſt delicate adjuſtments in the parts of the machine. (See a full deſcription of this in PLANING *Engine*, and alſo PRESS, *Hydroſtatic.*) In another part of the factory, it works a crane for lifting the heavieſt goods, by merely opening a cock, and lowers them down, by opening another, with the utmoſt ſafety. A very large *Flood-gate* is alſo raiſed up by two cylinders. (See that article.) It may be uſed for turning the bridges of canals. (See CANAL.) On the whole, we cannot conclude this article, without recommending the hydroſtatic principle very ſtrongly to engineers, as a method the moſt perfect of all others of communicating motion, which is to act only for ſhort extents, or with great power, as it can ſo eaſily be conducted through any circuitous rout, and loſes ſo little power by friction. The eaſe with which it is relieved from the action, or cauſed to operate in a contrary direction, is not its ſmalleſt advantage; and by means of the air-veſſel the power may be accumulated while the machine is preparing for action, and then an immenſe power ſuddenly given. We have little doubt the hydroſtatic-preſs would anſwer the beſt of any method for expreſſing oil. The preſent oil-preſs is deſcribed under OIL-*Mill*, and operates by a wedge, driven by repeated blows of a heavy ſtamper. The method is ingenious; but great part of the power is expended in friction, as is evident from the wedge requiring nothing to retain it, as it is driven, the friction over-balancing all the re-action of the ſubſtances preſſed.

A motion is very frequently required in machinery for giving to any piece of wheel-work an increaſed or diminiſhed velocity at pleaſure. The moſt complete of theſe are the EXPANDING *Riggers* (ſee that article); but many other means may be employed. Thus, on two parallel ſpindles, which are to turn each other, place a number of wheels, increaſing in ſize by regular ſteps, the ſmalleſt wheel of one ſpindle being oppoſite to the largeſt of the other. The ſame endleſs ſtrap will fit any pair of them, and give a great variety of powers and velocities: the ſame may be effected by having a number of cog-wheels; and, inſtead of a ſtrap, uſing an intermediate cog-wheel, which can be applied to connect any pair of the wheels at pleaſure. A very ingenious application of double cones is uſed in a cotton-machine, called the double ſpeeder. See MANUFACTURE *of Cotton*, alſo Mr. Braithwate's CRANE.

It is very cuſtomary to add what is called a fly to machines. This is a heavy diſk or hoop, or other maſs of matter, balanced on its axis, and ſo connected with the machinery, as to turn briſkly round with it. This may be done with the view of rendering the motion of the whole more regular, notwithſtanding unavoidable inequalities of the accelerating forces, or of the reſiſtances occaſioned by the work: it then becomes a regulator. Suppoſe the reſiſtance to a machine extremely unequal, and the impelling power perfectly conſtant; as when a bucket-wheel is employed to work one pump; when the piſton has ended its working-ſtroke, and while it is going down the barrel, the power of the wheel being ſcarcely oppoſed, it accelerates the whole machine, and the piſton arrives at the bottom of the barrel with conſiderable velocity; but in the riſing again, the wheel is oppoſed by the column of water now preſſing on the piſton: this immediately retards the wheel; and when the piſton has reached the top of the barrel, all the acceleration is undone, and is to begin again. The motion of ſuch a machine is very hobbling; but the ſurplus of accelerating force, at the beginning of a returning ſtroke, will not make ſuch a change in the motion of the machine, if we connect the fly with it; for the accelerating momentum is a determinate quantity: therefore, if the radius of the fly be great, this momentum will be attained by communicating a ſmall angular motion to the machine. The momentum of the fly is as the ſquare of its radius, therefore it reſiſts acceleration in this proportion; and although the overplus of power generates the ſame momentum of rotation in the whole machine as before, it makes but a ſmall and imperceptible addition to its velocity. If the diameter of the fly be doubled, the augmentation of rotation will be reduced to one-fourth. Thus, by giving a rapid motion to a ſmall quantity of matter, the great acceleration during the return-ſtroke of the piſton is prevented. This acceleration continues, however, during the whole of the returning ſtroke, and at the end of it the machine has acquired its greateſt velocity. Now, the working ſtroke begins, and the overplus of power is at an end. The machine accelerates no more; but if the power is juſt in equilibrium with the reſiſtance, it keeps the velocity which it has acquired, and is ſtill more accelerated during the next returning ſtroke. But now, at the beginning of the ſubſequent working-ſtroke, there is an overplus of reſiſtance, and a retardation begins and continues during the whole riſe of the piſton; but it is inconſiderable in compariſon of what it would have been without the fly: for the fly, retaining its acquired momentum, drags forwards the reſt of the machine, aiding the impelling power of the water-wheel. It does this by all the communications taking into each other in the oppoſite direction; the teeth of the intervening wheels are heard to drop from their former contact on one ſide, to a contact on the other. By conſidering this proceſs with attention, we eaſily perceive that in a few ſtrokes the overplus of power, during the returning ſtroke, comes to be ſo adjuſted to the efficiency, during the working ſtroke, that the accelerations and retardations exactly deſtroy each other, and every ſucceeding ſtroke is made with the ſame velocity, and an equal number of ſtrokes is made in every ſucceeding minute. Thus the machine acquires a general uniformity with trifling periodical inequalities. It is plain, that by ſufficiently enlarging either the diameter, or the weight of the fly, the irregularity of the motion may be rendered as ſmall as we pleaſe. It is much better to enlarge the diameter: this preſerves the friction more moderate, and the pivots wear leſs. For theſe reaſons, a fly is, in general, a conſiderable improvement in machinery, by equalling many exertions that are naturally very irregular. Thus a man, working at a common windlaſs, exerts a very irregular preſſure on the winch. In two of his poſitions in each turn, he can exert a force of near ſeventy pounds without fatigue, but in others he cannot exert above twenty-five; nor muſt he be loaded with much above this in general. But if a large fly be connected properly with the windlaſs, he will act with equal eaſe and ſpeed againſt thirty or even forty pounds.

If any permanent change ſhould happen in the impelling power, or in the reſiſtance, the fly makes no obſtacle to its production in its full effect on the machine, and it will be obſerved to accelerate or retard uniformly, till a new general ſpeed is acquired, exactly correſponding with this new power and reſiſtance. Many machines include in their conſtruction movements which are equivalent with this intentional regulation, a flour-mill for example. There is another kind of regulating fly, conſiſting of wings whirled briſkly round till the reſiſtance of the air prevents any great acceleration. This is a very bad one for a working machine, for it produces its effect by really waſting a part of the moving power. Frequently it employs a very great and unknown part of it, and robs the proprietor of much work. It ſhould never be introduced into any machine employed in manufactures, except in the inſtance of letting down heavy weights, where a waſte or re-action to power is the object.

Some rare caſes occur where a very different regulator is required, when a certain determined velocity is found neceſſary: in this caſe, the machine is furniſhed at its extreme mover with a conical pendulum, conſiſting of two heavy balls hanging by rods, which move in very nice and ſteady joint at the top of a vertical axis. It is well known, that when this axis turns round, with an angular velocity ſuited to the length of thoſe pendulums, the time of a revolution is determined.

Thus, if the length of each pendulum be $39\frac{1}{5}$ inches, the axis will make a revolution in two ſeconds very nearly. If we attempt to force it more ſwiftly round, the balls will recede a little from the axis, but it employs as long time for a revolution as before; and we cannot make it turn ſwifter, unleſs the impelling power be increaſed beyond all probability: in which caſe, the pendulum will fly out from the centre till the rods are horizontal, after which every increaſe of power will accelerate the machine very ſenſibly, as it then becomes a ſimple fly. Watt and Boulton have applied this contrivance with great ingenuity to their ſteam engines when they are employed for driving machinery for manufactures which have a very changeable reſiſtance, and where a certain ſpeed cannot be much departed from without great inconvenience. They have connected this receſs of the balls from the axis (which gives immediate indication of an increaſe of power, or a diminution, or reſiſtance,) with a cock, which admits the ſteam to the working cylinder. The balls flying out cauſe the cock to cloſe a little, and diminiſh the ſupply of ſteam, if the impelling power diminiſhes the next moment, and the balls again approach the axis, and the rotation goes on as before, although there may have occurred a very great exceſs or deficiency of power. The ſame contrivance may be employed to raiſe or lower the feeding ſluice of a water-mill employed to drive machinery. (See Mill.) Suppoſe all reſiſtance removed from the working point of a machine furniſhed with a very large or heavy fly, immediately connected with the working point; when a ſmall force is applied to the impelled point of this machine, motion will begin in the machine, and the fly begin to turn, continue to preſs uniformly, and the machine will accelerate. This may be continued till the fly has required a very rapid motion. If, at this moment, a reſiſting body be applied to the working point, it will be acted on with very great force; for the fly has now accumulated, in its circumference, a very great momentum.

If a body were expoſed immediately to the action of this circumference it would be violently ſtruck, much more will it be ſo, if the body be expoſed to the action of the working point, which perhaps makes one turn while the fly makes a hundred. It will exert a hundred times more force (very nearly) than at its own circumference. All the motion which has been accumulated in the fly, during the whole progreſs of its acceleration, is exerted in an inſtant at the working point, multiplied by the momentum, which depends on the proportion of the parts of the machine. It is thus that the coining preſs performs its office; nay, it is thus that the blackſmith forges a bar of iron. Swinging the great ſledge hammer round his head, and urging it with force the whole way, this accumulated motion is at once extinguiſhed by impact on the iron. It is thus we drive a nail; and it is thus, that by accumulating a very moderate force exerted during four or five turns of a fly, the whole of it is exerted on a punch, ſet on a thick plate of iron, ſuch as is employed for the boilers of ſteam engines, and the plate is pierced as if it were a piece of cheeſe. This accumulating power of a fly has occaſioned many, who think themſelves engineers, to imagine, that a fly really adds power or mechanical force to an engine; and, not underſtanding on what its efficacy depends, they often place the fly in a ſituation where it only added a uſeleſs burden to the machine. If intended for a mere regulator, it ſhould be near the firſt mover: if it is intended to accumulate force in the working point, it ſhould not be far ſeparated from it. In a certain ſenſe, a fly may be ſaid to add power to a machine, becauſe by accumulating into the exertion of one moment the exertions of many, we can ſometimes overcome an obſtacle that we never could have balanced by the ſame machine unaided by the fly. See FLY-WHEEL.

It is this accumulation of force which gives ſuch an appearance of power to ſome of our firſt movers. When a man is unfortunately catched by the teeth of a paltry country mill, he is cruſhed almoſt to mummy. The power of the ſtream is conceived to be prodigious, and yet we are certain, upon examination, that it amounts to the preſſure of no more than fifty or ſixty pounds; but this force has been acting for ſome time, and there is a millſtone of a ton weight whirling twice round in a ſecond. This is the force that cruſhed the unfortunate man; and it required it all to do it, for the mill ſtopped. We have been informed of a mill in the neighbourhood of Elbingroda, in Hanover, where there was a contrivance which diſengaged the millſtone when any thing got entangled in the teeth of the wheels. On being tried with a head of cabbage, it cruſhed it, but not violently, and would, by no means, have broken a man's arm.

It is hardly neceſſary to recommend ſimplicity in the conſtruction of machines. This ſeems now ſufficiently underſtood. Multiplicity of motions and communications increaſe friction; augment the unavoidable loſſes by bending and yielding in every part; expoſe all the imperfections of workmanſhip; and have a great chance of being indiſtinctly conceived; and are therefore conſtructions without ſcience. We ſhall conſider this object as applied to large machinery under MILL *Work*.

MACHINERY *for manufacturing Cotton*. See MANUFACTURE *of Cotton*.

END OF VOL. XXI.

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